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PRESIDENT'S ADDRESS

(Maricopa County Medical Society)

H. T. BAILEY, M. D.
Phoenix, Ariz.

(Talk before the Maricopa County Medical Society, at Phoenix, Ariz., at their January meeting in 1929.)

It should be the aim of every county medical society to carry on a continuous postgraduate course, and the value of the postgraduate work we do will depend here, as anywhere else, on the amount of time and interest each member of the society is willing to devote to study. We can gain ideas from any paper, even though we already know everything the author tells us, because he will likely present his thoughts in a different way and that will start our minds to work and will bring out new ideas. Therefore both courtesy and self interest demand that we stay to hear every paper on the program through. It encourages the reader if no one walks out on him, and it is more courteous to remain if the reader is young and inexperienced.

In this fast age, people have many obligations and work by the clock; therefore, we will begin our meetings on time and close them on time. If a doctor's family is at the theatre or a social gathering, or if he has calls to make and can be sure that he can come in on time and get away on time, he can make his plans accordingly and be sure of getting to the second engagement on time. In our business meetings it will be well for no member to claim the floor more than once on the same subject (Roberts' Rules of Order). I appreciate that this is dangerous ground for the chairman, because some one may take offense at such a ruling; it is likely that he will not try to enforce the rule, unless it is abused.

We believe it is better to have short papers. Three snappy papers of fifteen minutes each, with four to six discussions of from three to five minutes each, are much more interesting and profitable to a greater number of doctors than one paper that takes up the whole evening. Where an unusually interesting topic is to be presented by a prominent out of town speaker, this statement will not apply. Three papers can be read in forty-five minutes, and each discussed in fifteen minutes by from three to five speakers, so that the whole scientific program can be finished in ninety minutes, which will leave thirty minutes for the opening meeting, reading of minutes, new and unfinished business, etc.

Most people like to talk about themselves and their accomplishments; therefore, I believe it is better for members of our society to present papers based on observations of their own patients. Laboratory findings can be discussed by the laboratory consultant and other consultants can present their findings and discuss their opinions: a general discussion can follow.

With regard to programs, your new officers have thought that it will facilitate the arrangement of programs, if the entire membership of the society can be classified into such groups as will permit us to bring out the best work. We do not feel that we can make this classification, but that each of you should choose the class you prefer to work in, whether you do exclusive work in that line or not. For example, if you are doing general work and wish to give special attention to surgery or urology, or what not, take that classification and present your work before the society accordingly. A blank will be mailed you soon, to be filled out. After all the members are classified, each class will be asked to put on a program. If you will do this, you will not need a program committee, and it is too much to ask our secretary to do all the secretarial work of the society, and then to prepare programs in addition.

If every member will get in and do his bit, we will have good instructive meetings which will be genuine postgraduate work.

SUPRAPUBIC PROSTATECTOMY: ITS HAZARDS AND FACTORS OF SAFETY

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(Read before The Medical and Surgical Association of the Southwest, meeting in Albuquerque, New Mexico, November 8 to 10, 1928.)

Obstructive lesions of the prostate gland are often so insidious in onset, and progress so silently before the appearance of true symptoms, that the difficulties of treatment are usually greatly increased when the patient finally seeks medical consultation. In malignant disease of the prostate, although usually symptoms similar to those of benign prostatic enlargement occur, it may happen that few symptoms are manifested and the lesion will be discovered in the course of the general examination, either in an early or advanced stage, as determined on digital or cystoscopic examinations; or roentgenographic evidence of metastasis to bones, particularly those of the pelvis, may direct attention to the investigation of the prostate gland. It would seem that, in the presence of malignant disease of the prostate, little difficulty should be experienced in the diagnosis. However, early carcinoma is not always easily distinguishable by digital or cystoscopic examination from the inflammatory or prostatic type of lesion, or from an unusually hard benign type of adenomatous hypertrophy.

The insidious onset of prostatic enlargement, even in the presence of partial obstruction to the urethral channel, is emphasized by the number of patients seen in hospitals and clinics who are unable completely to empty the bladder and are entirely unaware of this inability, and also by the number of patients who are unaware of chronic distention of the bladder, the urinary act consisting of an overflow, a more or less constant dribbling, which the patient often considers incontinence.

It has been shown that, when residual urine is present due to prostatic obstruction, the back pressure on the kidneys, often with ascending infection, results in a varying degree of renal insufficiency, which usually is dependent on the amount of obstruction and residual urine and the duration of the obstruction.

Before the advent of tests of renal function, it was not possible to determine the degree of renal insufficiency, and uremia was a common cause of death following prostatectomy. During the early years of the development of prostatic surgery, prostatic obstruction was regarded as a local condition; it was regarded as entirely mechanical in its effect at the neck of the bladder, and, without further knowledge, removal of the gland was accomplished with an exceedingly high mortality rate. Fortunately, conditions have changed and prostatic obstruction is no longer considered a local disease confined in its effect to the bladder. It has become recognized that prostatic obstruction is largely a medical condition, that a general and not a local condition is present, and that a consideration of the cardiovascular and renal functions is of utmost importance. Experience has shown that, in more than seventy-five per cent of cases of prostatic obstruction, there is always some degree of impairment of renal function. The phenolsulphonephthalein return and urea determination serve as excellent methods of measuring renal function and determining, relatively at least, the degree of impairment. It may be stated that under no circumstances should prostatectomy be considered without previously having ascertained the renal function by one or the other or preferably by both methods. Considerable difference of opinion exists regarding the relative merits of these tests. A normal amount of urea may be obtained even when there is a narrow margin of renal reserve, but increased urea tends to indicate a degree of renal insufficiency which may be best determined relatively by the fractional phenolsulphonephthalein determination at fifteen-minute intervals for a period of two hours or more, and the observation of the time of the first appearance of the dye and the time of the maximal output. Delayed appearance of the dye and a lower than normal output in two hours are most significant in determining renal efficiency and reserve. These tests of renal function possess their greatest value as they are repeated at intervals of several days. As a working rule, it may be stated that prostatectomy should not be considered, except under most unusual circumstances, when the urea is more than fifty milligrams for each 100 c.c. of blood, or the phenolsulphonephthalein return is less than twenty per cent.

Among the hazards of prostatectomy are the various forms of associated diseases incident to the age at which surgical obstruction of the prostatic occurs. Patients aged less than fifty years rarely have benign prostatic obstruction. The average age of a series of 1973 patients operated on at The Mayo Clinic from January 1, 1918, to January 1, 1928, was sixty-four years; however, forty-eight per cent of them were between sixty-five and eighty. Thus surgical prostatic disease occurs at an age when degenerative changes are most marked. Unquestionably, prostatic obstruction, with the as-

sociated or resultant renal insufficiency, tends to emphasize or increase these degenerative changes. This is particularly true of the cardiovascular system. Willius has presented data showing that almost half of the patients with prostatic obstruction had clinical and electrocardiographic evidence of serious cardiac disease, and, furthermore, that the incidence of serious cardiac disease was higher in cases of prostatic obstruction than in other diseases during similar decades, indicating that coexisting cardiovascular diseaset is aggravated by persistent urinary obstruction.

That degenerative changes in vital organs, systems and structures must be taken into account, is well illustrated in a study of the relationship of age to mortality rate. First of all, it may be said that, in the modern treatment of prostatic obstruction, the mortality rate is about what the surgeon chooses to make it. In other words, it is in accordance with the acceptance or rejection of patients in terms of risk based on their general condition and the status of their cardiovascular renal reserve. If one is interested primarily in a low mortality rate, it becomes incumbent on him to select his patients carefully, accepting for operation only the preferred surgical risk, and denying the benefits that may occur from operation to the patient who is a substandard risk. Through recognition of the necessity of preoperative treatment in all cases, there has been a marked reduction in mortality rate, and recent years have witnessed the conversion from inoperability to a state of relative operative safety in many cases. If a competent surgeon is willing to accept substandard risks after adequate preoperative preparation, and accepts for operation all cases that do not present definite contraindications for operation, only a legitimate average mortality rate will result. The average mortality rate at the Mayo Clinic during the last ten years, in 1973 cases in which suprapubic prostatectomy was performed, was five per cent. During this time several series of 100 or more patients were operated on with one death, or not any deaths, in a series. This, however, does not represent the actual mortality rate of prostatectomy. Likewise, during this period the mortality rate by years ranged from two and three-tenths to eight per cent. These extremes do not necessarily represent the average mortality rate. It is the low mortality rate for which all surgeons strive, but renal insufficiency, cardiovascular disease and other degenerative changes in the aged, prevail as important hazards. The average mortality rate following prostatectomy in patients aged more than sixty-five years, was six and five-tenths per cent, as compared to three and nine-tenths per cent in patients aged less than sixty-five years. In very old patients the mortality rate rises rapidly; in the Mayo Clinic series it was fifteen per cent in patients between seventy-five and eighty, and seventeen per cent in patients more than eighty.

INDICATIONS FOR OPERATION

The best results may be expected from prostatectomy when the indications are obstruction to the normal act of micturition with failure completely to empty the bladder. An enlarged gland due to benign hypertrophy with residual urine, comprises the true indication for operation. It should not be inferred that marked enlargement of the gland is necessary to provide obstruction to the urethra, resulting in residual urine, for at times slightly enlarged glands and a moderate-sized intra-urethral adenoma provide adequate cause for obstruction and urinary retention. Likewise, the hypertrophy may be confined entirely to the median lobe, providing ball-valve obstruction at the internal urethral orifice. On the other hand, a huge gland may be encountered with extensive intravesical enlargement without resultant obstructive symptoms or residual urine. It is important to determine in each case whether or not actual obstruction and residual urine are present as the result of prostatic disease. The inflammatory or prostatitis type of gland is sometimes only a part of an inflammatory process of the lower urinary and genital tracts, which may be productive of frequency, difficulty, pain, and so forth, without producing actual obstruction or resulting in residual urine or retention, and may be mistaken for a surgical lesion of the prostate. The inflammatory or prostatitis type of gland comprises about fifteen per cent of the cases in which operation is indicated, but in these cases great care is exercised to determine that they are obstructive and productive of retention to some degree. Experience has taught that prostatectomy in this type of gland in the absence of obstruction and retention, is not productive of the desired relief from frequency, difficulty and pain. In my earlier experience some of these patients were operated on without benefit.

The question often arises as to whether or not the symptoms of which the patient complains are the result of prostatic hypertrophy, or whether some other condition is present which may be responsible for retention, frequency, and hematuria. It must be borne in mind that, during the prostatic age, many local or associated lesions of the bladder may produce symptoms of prostatic ob-

struction. The examination should always include a Wassermann test of blood, and, in the event of a positive reaction, careful neurologic and cystoscopic examinations are necessary to determine the possibility of an associated cord bladder. At times, true cord bladder is associated with marked prostatic hypertrophy and obstruction, requiring careful consideration of the advisability of prostatectomy. In general, under such circumstances, if one has reason to believe that the retentioin is the result of prostatic obstruction rather than of atony of the bladder on a neurologic basis, prostatectomy may be considered with reservations on the postoperative activity of the sphincters. Retention may be marked and digital examination of the gland may not disclose demonstrable enlargement. The examination under such circumstances should include cystoscopy for associated lesions of the bladder. In my experience vesical calculi are associated in ten to twelve per cent of the cases of prostatic hypertrophy; also diverticula of the bladder are associated in five to seven per cent of the cases, and, in some instances, when of large size may be entirely responsible for retention. These, at times, are epuivalent in size to the normal capacity of the bladder. Hematuria is sometimes a significant symptom of prostatic hypertrophy; however, hematuria should stimulate one to investigate the bladder and the higher urinary tract for new growths before assuming that its origin is the prostate. Cystoscopy is necessary in many instances, but it has been the practice at the Clinic to employ it only in cases in which some question exists as to whether the prostate gland is entirely responsible for retention or whether there are associated lesions. If prostatic enlargement is definitely determined by digital examination, cystoscopy or cystogram, and there is retention of urine, the indications for operation are clear.

In the earlier years of prostatic surgery, the gland was removed only as a more or less heroic measure when urethral catheterization failed or if, in the event of cystostomy, it was desired to reesetablish the urethral urinary act. On account of the high mortality rate following prostatectomy, temporizing methods were recommended and resulted in a catheter life with limited longevity in many instances that is, operation was justly postponed as long as possible. During recent years, with the advent of reliable tests of renal function and the accumulation of knowledge of the effect of long-continued prostatic obstruction, retention and infection, methods of treating prostatic obstruction have changed materially, with the result that the mortality rate has been markedly reduced and greater longevity assured.

The adoption of certain principles in the preoperative preparation of patients and the improvement of principles involved in the surgical removal of the prostate, have made it possible for most patients to be operated on with a relative degree of safety. Certain limitations, however, should be placed on prostatectomy. In view of the relatively high mortality rate in patients aged more than eighty, the question of the advisability of prostatectomy should be carefully considered. Palliation is readily obtained by intermittent catheterization or the use of a permanent indwelling urethral catheter or simple suprapubic cystostomy, and, although voluntary urination or restoration of the urethral channel may be greatly desired by the patient, greater assurance of prolongation of life with minimal risk may be provided by these methods than by prostatectomy unless the patient is unusually robust and possesses considerable organic reserve. Likewise, palliation by suprapubic cystostomy is sometimes necessary for younger patients, in whom, as a result of long-continued urinary obstruction, irreparable injury to the kidneys has occurred, thus placing renal reserve on a narrow margin. Malignant hypertension and cardiac decompensation are distinct contraindications to prostatectomy.

PREPARATION OF PATIENTS FOR OPERATION

For many years it has been recognized that patients who had had prostatic obstruc tion for years and entered the hospital with chronic overdistension of the bladder, required methods of combating uremia, toxemia and the generalized effects of urinary retention. Attention was directed toward the improvement of their general condition and restoring organic reserve. Experience showed that, with restoration of organic reserve through adequate treatment, prostatectomy was subsequently accomplished with a relatively low mortality rate. The importance of adequate treatment of a certain group of patients was clearly manifested.

It would seem that the patient who has not suffered great disability as the result of urinary obstruction, but has continued at his work, and who appears on examination to be in g-ood general condition with adequate cardiovascular-renal reserve and little, if any, demonstrable injury resulting from a moderate degree of obstruction and urinary retention, should not experience any particular hazard in immediate operation. This, however, is not the case. Some time ago, in a review of the relationship of preliminary treatment to mortality rate following prostatectomy, I presented data showing that

the rate in cases in which the surgical risk apparently was relatively slight, and in which the operation was performed without preoperative treatment, approcahed very nearly that in the cases in which the general condition was poor, and there was definite renal insufficiency, infection of the urinary tract, and grave cardiovascular disease, but operation was performed only after adequate preoperative treatment. The merits of preliminary treatment in all cases have been definitely established, and it may therefore be stated that prostatectomy should never be performed without a period of preoperative treatment. Drainage of the bladder is most important and, unless there are good reasons for cystostomy, should be established by the permanent indwelling urethral catheter and continued until the cardiovascular-renal reserve has been restored to a point of relative safety for operation.

The length of time that drainage of the bladder is necessary, is variable. A minimum of ten days has been adopted in the preferred type of case. Drainage may be necessary for weeks or months preceding prostatectomy, entirely dependent on the rapidity with which restoration occurs. Suprapubic drainage is necessary when there are associate multiple or large stones and diverticula, and in cases in which prolonged drainage over a period of months is necessary. In certain cases, also, intolerance to the urethral catheter method of drainage is the method of choice, for it limits the surgical procedure to one operation and facilitates visualization. Urethral catheter drainage has been the method of drainage in approximately seventy-five per cent of the cases at the Mayo Clinic.

Suprapubic drainage provides an excellent method when it is necessary, and insures the greatest safety in the treatment of patients in poor general condition, since the procedures are divided into stages, of which the first stage may act as a test of reserve. Because of lack of physical fortitude, the divided operation is justifiable for the aged patient, its disadvantages being accepted in favor of safety. Under careful clinical and urological observation during the period of drainage, much may be accomplished in combating infection of the urinary tract, restoring renal function and improving the general condition of the patient.

PRINCIPLES OF THE OPERATION

Inasmuch as the object of preoperative treatment in all case has been the restoring of organic reserve and fortifying the patient against the hazards of the operation, it becomes the responsibility of the surgeon to sustain that organic reserve and obviate the hazards. Modern methods of prostatectomy require modern methods of anesthesia, accurate conduct of the operation, and accurate and complete hemostasis.

The first factor of safety in performing prostatectomy is the anesthesia. It is safe to say that many postoperative complications, pulmonary, cardiovascular, and renal, have in the past been indirectly, if not directly, due to the use of the general anesthetic. Ether as a general anesthetic presents the greatest hazards in cases of prostatic obstruction; not in its administration, during which there is a wider margin of safety than in the administration of other general anesthetics, but in the subsequent renal depression and acute pulmonary complications. If renal insufficiency has been present, even though reduced by established methods of preoperative treatment, the patient is particularly susceptible to such depression. At the age when prostatic obstruction occurs, patients are susceptible to the inhalation type of pneumonia, to acute bronchitis, and to pulmonary edema. The various gas anesthetics have much to commend them. Except under the conditions of skillful administration, however, they often produce cyanosis when anesthesia is carried to the point of complete relaxation so necessary to the accuracy of the operation and complete hemostasis. Lundy has called attention to the deleterious effect of repeated cyanosis. Regional anesthesia, when accurately administered, obviates the hazards of the inhalation anesthetics, provide complete anesthesia in most instances, rarely requiring inhalation aid, and tends to sustain organic reserve.

It is not my desire to discuss the various methods by which the prostate gland may be approached surgically. I believe that progress has been made and the methods of perineal and suprapubic approach have been improved to such an extent that, in the hands of those most experienced in the respective methods, there is little difference in the mortality rate and ultimate functional results. Unfortunately, there is a definite mortality by either method, usually as a result of associated or coexisting organic disease. The suprapubic one-stage visualized operation should be considered the suprapubic method of election, and the two-stage suprapubic operation as one of necessity. The indications of necessity have been considered and comprise associated conditions in which the disadvantages of the divided operation must be accepted. The one-stage visualized operation merits its rank as the method of choice in that accuracy of conduct under the guidance of the eye affords a clean prostatic capsule, devoid of remnants of prostatic tissue and tags. Furthermore,

hemostatic measures may be accurately applied to the extent of providing complete control of bleeding. The inelasticity and loss of resiliency of his cardiovascular system in patients in the prostatic age, does not allow great reduction in the total blood volume of the body without marked disturbance to the organism as a whole and the vital functions in particular. A moderate operative blood loss or the continued hemorrhagic urine for several days, manifesting inaccurate hemosatsis, is not well borne at the prostatic age. Reduction of blood pressure through operative or postoperative hemorrhage, manifests itself rapidly in poor renal function and seriously depletes renal reserve. No factor is more important than accurate hemostasis. Many methods have been advocated and used; however, suture of vessels at the neck of the bladder and the Pilcher bag in the prostate capsule in all cases have proved most effective methods.

Experience has shown that patients who have been carefully prepared for operation and are operated on under regional anesthesia, and in whom the one-stage visualized operation is performed with accurate hemostasis, manifest little postoperative reaction and proceed through a satisfactory convalescence.

Postoperative complications have been materially reduced through preoperative treatment and careful surgical procedures. Pulmonary complications are encountered, and when they occur they are usually embolic in origin. Temporary urinary incontinence has been observed in a few cases following suprapubic prostatectomy and in most instances continence has been restored thru muscle training. The two normal sphincters of the bladder afford better urinary control than either one alone. In many patients in whom there is intravesical enlargement of the gland, the internal sphincter has failed to function by virtue of its dilation by the gland. In such cases, restoration to function does not always occur subsequent to prostatectomy, entire reliance for control being placed on the external sphincter. In many instances of long continued retention, with a resultant overdistended bladder, preoperative incontinence of the overflow is encountered, the retention resulting from the obstructing gland, but with sphincters relaxed.

Postoperative epididymitis is an unfortunate complication. It may be entirely obviated through early preoperative ligation or division of the vas. I have employed this in a number of cases but I have not as yet been able to accept the idea that the method should be instituted in all cases of surgical prostatic disease.

There are many phases of the treatment of prostatic obstruction worthy of consideration, but it has been my purpose to discuss mainly the hazards of the obstruction and surgical procedures, and to present, in general, principles that have been instrumental in the reduction of mortality rate and improvement of ultimate functional results.

DISCUSSION

DR. A. H. VOGT, Albuquerque: I have enjoyed Dr. Hunt's paper very much and would like to ask him whether he uses decompression of the bladder in the upper urinary tract by the same mechanism which is used by Dr. Young routinely at the clinic, or if he depends on catheter drainage of the bladder prior to prostatectomy. I am very glad to have heard Dr. Hunt intimate that urea content of the blood is a very good indication of the function and gives a good idea as to how close your patient is to a prostatectomy. It has been my practice to ask my patient to have a blood urea made every month and check them up.

Q. Dr. Hunt, how often do you use spinal anesthesia, if at all?

DR. HUNT (closing): I am very glad to have had this discussion. In 1921, a doctor in California presented a very excellent method of decompressing the bladder. Before that we had all recognized that those patients coming in with chronic distention many times were in a uremic stage and just required some little thing to be done. We noticed that oftentimes recovery from the uremia was difficult, so we welcomed this method of decompression of the bladder. Now, if a patient who has an overflow comes in, he is sent to the hospital and a urethral catheter is introduced. Two or three days are required, frequently, completely to empty these bladders. You simply insert a catheter and clamp it off, then connect the tube to the receptacle at the end of the bed and leave the receptacle at such a height that the urine will empty at a little faster rate. This will determine the rapidity with which the bladder is being decompressed.

Regarding the urea, as I said in my paper, we employ the phenolsulphonephthalein test as a routine procedure. In persons of good health, we can get a perfectly normal blood urea, so it only takes a moderate amount of kidney tissue to give a normal urea and it does not measure the amount of damage done at all. Therefore the urea does not mean a great deal except that, when you get a normal urea, it shows you what the kidney is capable of when normal, so you have no idea what the patient's reserve may be. One of the best methods we have found has been the so-called French test. Take it every fifteen minutes and determine the percentage at that time. If the height of the curve occurs early, you have reason to believe the reserve is much greater than when the height of the curve is low.

We used spinal anesthesia a great deal up to about five years ago, when Doctor Coué of France, came over. He brought with him new ideas in this respect. We used them in several hundred cases in prostatic surgery. However, we differentiated it because of the fact that we noticed, in many of these patients, we had a marked drop in the blood pressure, and the patient cannot tolerate very well that reduction in blood pressure. I have seen it drop down to 80 within a few minutes after the patient has been given spinal anesthesia. He becomes quite clammy and in a number of instances I thought the patient was going to die. Fortu-

nately, we had no deaths, but, because of the high percentage of cases who had this particular depression symptom, we have given it up. There is a control spinal anesthesia which has been used somewhat, in the clinic, with success. To me, the blood pressure drops have been a very serious source of worry. I do not like any anesthetic in which there is a cyanosis.

LUNG ABSCESS

JOHN WILLIAM SHUMAN, A. B., M. D., F.A.C.P.
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(Read before The Medical and Surgical Association of the Southwest at its Fourteenth Annual Meeting, Albuquerque, N. M,. Nov. 8 to 10, 1928.)

Most lung abscesses are unrecognized because they are minute. They rupture, are coughed up and heal; for example, in children after tonsillectomy. Many lung abscesses drain through a bronchus and heal, or become a clinical bronchiectasis. Other abscesses rupture into the pleural sac and are diagnosed empyema. Others form an adhesive pleuritis, are aspirated, and erroneously diagnosed empyema.

Aneurysms, cysts, granulomas and neoplasms add to the complexity in diagnosing lung abscess. An abscess of the lung is a circumscribed area of pus within the lung. An inter-lobar abscess is clinically a lung abscess and should be so treated. Abscess may be caused by aspiration, metastases or trauma, or it may complicate granuloma, neoplasm and pneumonitis.

There has been an increasing frequency in the earlier recognition of lung abscess since the advent of the x-ray. Lung abscess is neither rare nor easy to diagnose correctly. To-wit, these four comparatively recent experiences with febrile lung abscess from one hospital service. (The United States General Hospital of Los Angeles County, California.)

CASE 1

Lung Abscess Complicating Neoplasm.

A white male, aged 29, was admitted May 5, 1926, with a temperature of 100, plus 110, respiration 24 and a loss of 20 pounds in weight. On April 5 he complained of "headache, fever, blood-spitting and night-sweats," when he consulted a physician who diagnosed "pulmonary tuberculosis." One right rib had been fractured thirteen months prior. He suffered severe attacks of right-sided pleurisy thereafter.

There were present: pyorrhea, infected tonsils, an enlarged thyroid, palpable sub-maxillary, epitrochlear, inguinal and left supra-clavicular lymph nodes; also restriction of mobility, increased fremitus, diminished resonance from the fifth rib to the apex and dullness in the second right and third interspaces. White blood count, 18,000; polynuclears, 82 per cent. Sputum, scant. "No tubercle bacilli found." Diagnosis: Lung abscess.

X-ray findings by Dr. Shawhan, (Fig. 1): "Abscess of upper right lobe. No evidence of tuberculosis."

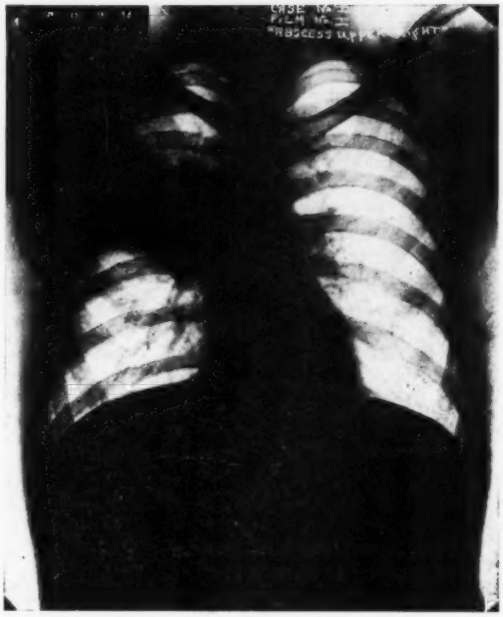

Fig. 1. X-ray appearance in Case I, suggesting abscess of upper right lobe; roentgenogram taken on entrance, in May.

Dr. Mattison resected parts of the right fourth and fifth ribs and found the pleura adherent. Aspiration was "negative." Operation was halted because the patient was not taking anesthesia well.

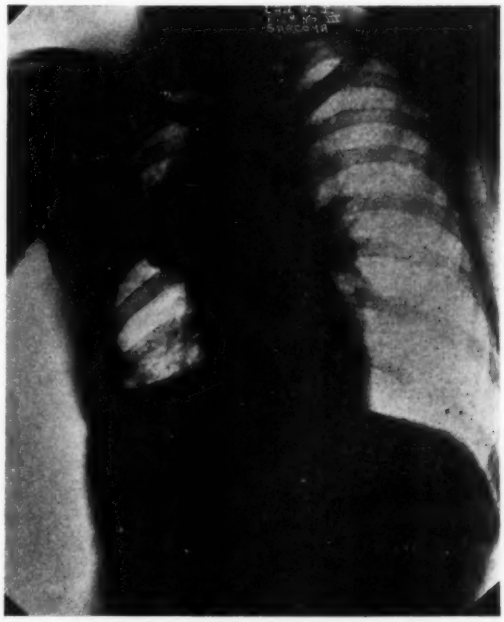

Fig. 2. Case 1. Roentgenogram taken in September, which shows evidence of newgrowth, not recognized prior to autopsy.

Three days later the dressings were saturated with pus. A fortnight later, a normal temperature and no drainage.

July 6, 30 c.c. of thick, foul smelling pus (gram negative and positive bacilli) were aspirated from the right pleural sac. July 12, the ninth rib was resected and much pus obtained. The next three weeks patient was septic. August 25, cyanosis of face and chest and mental confusion, developed. September 22, embolic phenomena, namely, internal mammary venous thrombus (postulated cause for cyanosis), mitral murmur, and many metastatic dermal, subdermal and intramuscular abscesses were noted. Autopsy, October 7, found alveolar sarcoma involving the upper lobe of the right lung and superior mediastinum.

In retrospect, the clinicians missed the sarcoma until late. Too much reliance was placed upon the x-ray for the diagnosis of lung abscess. A careful survey of later x-ray films, especially one of Sept. 23 (Fig. 2), definitely indicated neoplasm Secondary infection of a neoplasm is common.

CASE 2.

Lung Abscess and Osteomyelitis.

No. 8804. A white male, aged 28, was admitted October 25, 1926, complaining of "cough, expectoration, pain in the right chest, and rheumatism in right arm and shoulder for three weeks."

History of pleurisy at intervals since 1924. In 1925, a Veterans' Bureau physician diagnosed "tuberculosis." Unable to work during the past year. Eight months ago eight teeth were extracted, followed by "gum-boils" for four months. Three months ago, was diagnosed "bronchiectasis," because of intermittent fever and expectorating a cupful of odorless sputum each day.

Well developed and nourished, with slight pallor and clubbing of finger ends. Temperature 100 and pulse 96. Lagging of the right base with increased fremitus and dullness from the sixth rib and seventh dorsal spine, downward. Distant breath sounds and coarse rales over this area. Tender right deltoid and biceps. White blood cells, 31,400; polynuclears, 71 per cent. Sputum: upper frothy, middle clear, lower layer flocculent. X-ray findings by Dr. Shawhan: "Bronchiectasis of right base." (See Fig. 3.)

November 19, the internists wrote: Lung abscess which drains periodically, causing neuritis in right shoulder and arm, hoarseness and all other symptoms. The lesion, its chronicity, and the recent lesson (in case 1) suggest neoplasm."

November 28, pain, swelling and redness of right elbow developed. The white blood count rose to 35,000, with 86 per cent polynuclears, and the temperature to 103. As there was little pathology in his chest, at this time, it was felt that more than an infective arthritis was present. X-ray examination revealed osteomyelitis throughout the shaft of the right humerus. Opened and drained, the pus containing staphylococci and a gram positive spore-former. Drainage was followed by steady improvement. February 1, chest was clear and patient appeared and felt well. Right base shadow shown at previous examination had disappeared.

Osteomyelitis is not prominently mentioned as a complication of lung abscess, but should be considered in any case where pus is present.

CASE 3.

Chronic Lung Abscess from Wound.

No. 10999. A white male, aged 32, was admitted March 27, 1928, with history of multiple shrapnel wounds of right chest, October, 1918. Rib resection and drainage while in France, again in 1919 and 1923 because of sinuses which drained continuously since injury and are draining at present.

Lipiodol injection and x-ray by Dr. C. W. McClanahan, revealed fistulous tracts extending from two external openings into a bronchus (see Fig.

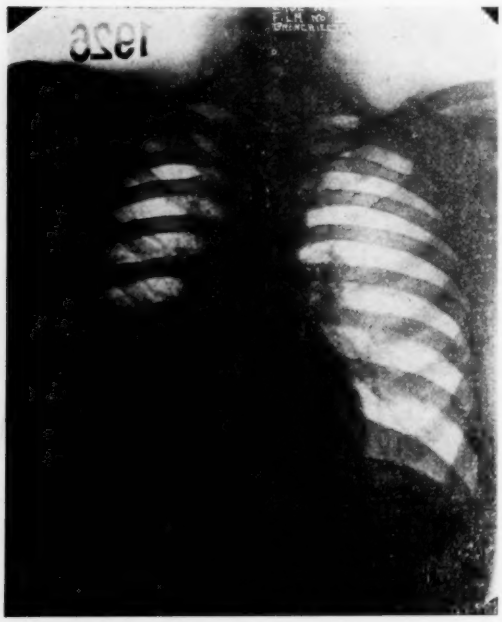

Fig. 3. Case 2. X-ray findings were interpreted as bronchiestasis of the right base.

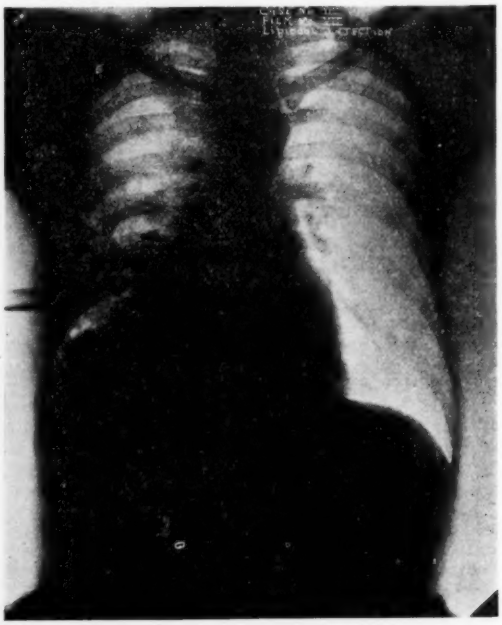

Fig. 4. Case 3. Injection with lipiodol of fistulous tracts leading from osteomyelitis of rib and communicating with bronchus.

4). There was also osteomyelitis of the seventh to twelfth right ribs inclusive, posteriorly.

Temperature, 101; pulse, 100; hemoglobin, 54 per cent; red cells, 3,800,000; whites, 14,100, with 70 per cent polynuclears. Diagnoses: chronic pulmonary abscess with bronchial and external fistulas; also osteomyelitis of ribs.

This was a classical example of the type of case which responds to thoracoplasty. A two stage operation was performed by Dr. Mattison and recovery was rapid and lasting.

CASE 4.

Typical Acute Lung Abscess.

No. 11542. A white male, aged 35, was admitted July 24, 1928, with history of pneumonia May 12, and three weeks in hospital. A week after returning home, he developed severe pain in the left lower chest, a high fever, fast pulse and a productive cough.

He was undernourished and had diminished breath sounds and fremitus over the left lower chest, in the mid-axillary line. White blood count, 18,000; polynuclears, 85 per cent; temperature, 100; pulse, 90. X-ray findings by Dr. McClanahan confirmed the clinical diagnosis of left lung abscess (Fig. 5).

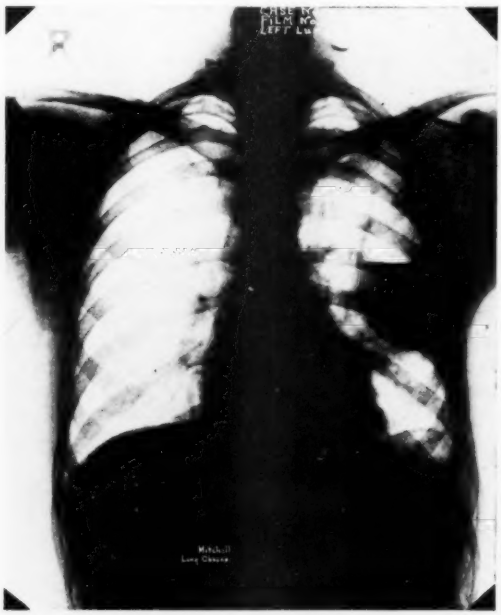

Fig 5. Case 4. Typical acute lung abscess of the left lung, showing fluid level.

Rib resection was performed and adequate drainage instituted and one month later the patient was discharged, apparently cured. This was a typical acute lung abscess complicating pneumonia.

Lung abscess should be suspected as well as empyema in pneumonia which does not resolve on time.

All chest complaints, for example, pain, cough and expectoration should have intelligent inspection, palpation, percussion and auscultation, augmented by clinical and x-ray laboratory findings, for the recognition and good management of lung abscess.

Lung abscess and gangrene are two distinct lesions. Sputum analysis will help differentiate. In lung abscess the sputum is yellow, purulent and odorless and shows pyogenic organisms. Sputum of gangrene is foul smelling and grayish brown or green and shows characteristic spirochetae, fusiform bacilli and vibriones.

The treatment of gangrene should be medical (arsphenamin) before surgery is employed. Abscess should be drained externally. Small incisions handicap. A wide resection of two or more ribs permits of a more comprehensive search and manipulation and of better drainage and effective compression.

DISCUSSION

DR. LeROY S. PETERS, Albuquerque, N. M. (opening): I feel that I have to discuss this fine paper. I am not going to discuss the diagnosis, but want to say a word about the treatment of lung abscess. I want to try to convey the impression to this audience that, although I am a believer in climate, I do not believe in climate in the treatment of lung abscess. A number of men have referred me long abscess cases with the idea that climate cures it, and one man in particular has become peeved because I called my surgeon in to do what he wanted the climate to do.

It is our practice, if we get an early lung abscess, to institute drainage and then, in a reasonable length of time, attempt artificial pneumothorax. However, the majority of the cases we get are of too advanced standing to permit of artificial pneumothorax, and then it becomes necessary to resort to more radical lung surgery.

I want to express to Dr. Shuman my appreciation of his most excellent diagnostic paper.

DR. SIMON JESBERG, Los Angeles, Cal.: I think we so carelessly use the term "lung abscess." If most of the conditions in which we have given out the diagnosis as "lung abscess" were called "lung suppuration," it would be more accurate. It is not an abscess in the sense of the word the speaker is talking about. Dr. Shuman is speaking of a cortical collection of pus, and that is different. We have many cases we treat that commonly would be called lung abscess, yet they are cases of lung suppuration and not abscesses at all. There is a definite distinction as to treatment and prognosis, as well as diagnosis. It may be that cortical lung abscess does occur as post-tonsillectomy and dental extraction, but the general thing that occurs in this particular type is an aspiration affair, consequently it is going to be where large air passages are and it is going to be in the air passages and not in the interstitial tissues. That is the difference between these lung suppurations and the kind of abscess Dr. Shuman mentioned. The kind of abscess the doctor spoke about, you can accomplish nothing for with the use of the bronchoscope, as it is out of reach. Dr. Hunt mentioned the rupture of a perinephritic abscess into the pleural cavity. I had one patient referred to me for lung suppuration in which the bronchus would not heal. I called it to the attention of a surgeon and suggested a perinephritic abscess, which was correct.

Question: I should like to ask Dr. Shuman how long it takes to get clubbing of the finger ends.

DR. SHUMAN (closing): Dr. Peters is more than ordinarily polite to me, but then, I am his guest. An abscess is a circumscribed area of pus; when it has ruptured, it is either draining out through or into the pleural cavity as an empyema. Empy-

emas are caused, four-fifths of the time, by an abscess. Most lung abscesses go unrecognized, as I said in the paper, because they are minute, rupture, are coughed up and heal, as in children following tonsillectomy. Most children get a physical examination before tonsilectomy, but that physical examination is more or less a defensive affair and is done in a more or less cursory manner, as the case has been referred for a tonsillectomy and that is what the child is supposed to get. Following tonsillectomy the child may not get along just right. He is under par for a period and it is at this time that there may be a minute lung abscess. I believe the lung pathology is not a bronchitis, as it has passed that stage, and in many cases I suspect a minute abscess.

In regard to clubbing of the finger ends, the shortest possible time is three weeks.

FOOD SENSITIZATION AND ITS TREATMENT.

ORVILLE HARRY BROWN, M. D., Ph. D.
Phoenix, Arizona

(Read before the Arizona State Medical Association in Tucson in April, 1928.)

I shall report a series of over two hundred observations. From these there are certain obvious and important conclusions; important because, I believe, the information will assist others to relieve much suffering, which would otherwise continue more or less indefinitely. The observations also suggest certain other possibilities which I shall point out. I shall not make complete case reports as little would be gained thereby and the paper would be made entirely too long. Whenever available I shall give a sufficient number of observations to make the point I present as impressive as possible.

In the observations there are facts which bear upon etiology and upon parts and tissues affected, and which hint at an explanation of two baffling conditions: and most of all, I repeat, they have suggested fairly successful methods of treatment. I shall also present my conception of what takes place in the body to produce the symptoms and signs of sensitization.

For the clinical conditions which I term "food sensitization" various authors have used other terms. I shall give the definitions of two of the common terms, allergy and anaphylaxis, which seem the most fitting. In using the term "food sensitization," I am following Vaughan who used "protein sensitization" as the general term. Coca uses the word "atopy" as the general term.

My two definitions are taken from that splendid work of Gurd, entitled "Infection, Immunity and Inflammation." The first is: "Anaphylaxis is a phenomenon in animals which have received parenterally small doses of heterologous proteins (albuminous substances) as a result of which they become abnormally sensitive to the subsequent introduction of the same antigen. This abnormal sensitiveness is manifested by the onset of marked symptoms of tissue irritation following the introduction of foreign protein, in amounts which are harmless to the normal animal." The other reads: "Allergy (von Pirquet and Schick), as the name implies, is an altered reaction (inflammatory in nature) in the hypersensitive animal which is noted at the site of injection, following the focal introduction of antigen."

Gurd presents a theory, which has been helpful, to explain the sensitization reactions. Following the parenteral introduction of a protein the tissues develop two antibodies to destroy the protein. The first he designates as "immune body of the first order" and the second as "the immune body of the second order." The immune body of the first order attacks the parenterally introduced heterologous proteins and reacts with it to produce a substance highly irritant to the tissues. The immune body of the second order, if present in sufficient quantity, so alters the product of the reaction between the antigen and the immune body of the first order, that it ceases to act as an irritant to the tissues. In sensitized individuals the immune body of the second order has failed to appear in adequate quantities, or for some reason is not competent to function to the proper extent.

Another quotation from Gurd may help to clarify the question a bit: "Degradation products of protein cleavage closely related to the peptones and proteoses, at least in so far as this relationship refers to the stage in the digestive process at which they are produced, are potent to produce, upon intravenous injection into animals, symptoms which are indistinguishable from those which characterize anaphylactic shock."

With the help of the ideas taken from Gurd, I have arrived at a conception as follows: For reasons, some of which appear in my observations, a protein escapes digestion in the alimentary canal and is absorbed undigested into the body, and results, relatively, as though it had been introduced intravenously. An enzyme developed by virtue of previous absorptions of the undigested protein attacks it and carries its digestion to the stage, or a stage, related to peptones and proteoses, which is highly irritant and toxic to the tissues; a second enzyme is necessary to compete the digestion. In case the second enzyme is not developed, the toxic substances exert their effects until the second enzyme can be developed. It has seemed to me that probably both enzymes are developed simultaneously, but that the first one has an easy task and the second a more difficult task and one that it cannot do as rap-

idly as the first enzyme does its task. Therefore, when the supply of undigested protein reaches the blood and tissues in a steady plentiful quantity the first enzyme splits all, or at least a relatively large amount, into the toxic substances and enzyme number two, because it has the more difficult work, necessarily falls behind. So long as the source of supply of the whole protein is uninterrupted the sensitization phenomena prevail. My observations, I believe, throw light on what may happen from this point.

OBSERVATIONS

For reasons which will be apparent, or later explained, the observations made upon any one patient will be presented as a group. For easy reference each observation will be numbered.

In my test box I have the proteins of whole egg, egg white, egg yolk, ovovitellin and ovomucoid, of whole milk, of casein and lactalbumin, of whole wheat and of five separate proteins of wheat. It not infrequently happens that the whole egg, milk or wheat may fail to give reaction whereas one or more of the individual constituents of the respective substance may give reactions (1).

A woman developed asthma repeatedly after eating lettuce though her skin test to lettuce protein was so weak as to be designated negative, or at best only questionable (2), on repeated trails.

A young woman came to Arizona and was relieved, for a time, of asthma (3) without medical aid. Later when suffering severely she was found sensitive to grape fruit, which she regarded as particularly delectable (4). The grape fruit was eliminated and she was advised to substitute orange; the asthma was relieved only to return again after several weeks. She was retested, especially for orange and grape fruit, and I was surprised to find sensitization to orange and not to grape fruit (5). The reversal of sensitizations occurred at least another time.

It has been repeatedly observed that a protein test upon the skin may show a hive at the site of the test and after a few hours an area of redness and induration lasting a number of hours even up to seventy-two hours or longer (6). In certain instances there may be little or no hive and a subsequent redness (7). I have made the repeated observation that the intradermal test gives more clear cut, easily interpreted, reactions than the scratch method (8).

A woman had asthma from food sensitization; her reactions were so numerous that it was impossible to give her a diet that afforded her any notable relief (9). Without resorting to a compilation of statistics in this paper the assertion is made that multiple sensitization is the rule (10). I have made use of a food elimination test to obviate the making of the skin tests or to corroborate their findings with a minimum of success (11).

Most cases of sensitization give definite family histories of sensitization phenomena (12). One case had asthma at birth (13) as evidenced by the asthmatic rales the mother heard when the babe was first put in her arms. The father remembers distinctly that there was a typical paroxysm within the first few days of life. This boy is now twenty-two years of age and he has had asthma practically all of the twenty-two years in spite of all sorts of tests and treatments. For the past three weeks he has been taking a prescription of calcium iodide, dilute hydrochloric acid and pepsin (14) and he has gone longer since this was begun than for any period that he can remember within the past five years (15), without making it necessary to take adrenalin.

A boy had severe asthma in the east and was tested for his sensitizations and he had multiple sensitizations (16) to foods. These were eliminated from his diet with relatively little improvement (17). A change of climate was recommended and on his way to Arizona he became relatively free of asthma (18). After he had been here a short time I examined him, found his hydrochloric acid was low (19) and that there were asthmatic rales throughout his chest. He was given the digestant mixture and he is able to run and play (20) as he had not done before in his life, and seems entirely well.

A woman had a mild type of rheumatic pains referable more to the joints than to the muscles. Typical findings of inflammation were not present. The usual treatments were used with no benefit. At the suggestion of the father who had a vague idea that rheumatism might come from eating too much citrus fruit (21), I advised a discontinuation of the citrus fruits though I confess I had no hope of benefit therefrom. This was ten years ago. Improvement was prompt when the fruits were eliminated (22). She had been eating freely (23) of citrus fruits since coming to Arizona.

A woman had an extremely irritable bladder, frequent urination and an inability to retain urine over a few minutes at a time (24). She had been examined cystoscopically and been told that she had an edema, and dilated capillaries of the bladder. The skin tests for foods showed that she had multiple sensitizations to foods (25). The offending foods were eliminated from her diet as com-

pletely as possible and she made slow definite improvement (26).

A man had hives (27) nearly all the time for the greater part of two years. This was before the time I had the test materials. I realized that the hives were probably from the foods in his diet. I gave him the strictest possible diets (28) but the results were unsatisfactory (29). After getting the tests I tested him and found multiple sensitizations (30); all reacters were eliminated (31) and within a few days he was well. I instructed him not to attempt to go back to any of the harmful foods for a month to six weeks but he afterwards told me that he was able, after about ten to twelve days, to eat his old diet without hives (32). He has had no return of hives but he does have an unexplained melancholia (33) which I now propose to investigate from the standpoint of sensitization.

This past winter I had an elderly woman who had an acute respiratory tract infection following which came hives (34). I gave her the hydrochloric acid mixture and she had prompt recovery (35). She also has a moderate to severe type of hypertension (36).

A young man had the influenza infection in the 1918-1919 epidemic, which confined him to his bed for several weeks. His illness gradually within a few weeks changed into asthma (37), from which he suffered periodically for several years. From the history I suspected a bacterial sensitization. All bacterial tests, however, were entirely negative (38). It occurred to me then that, as his asthma began in the spring of the year, perchance pollen might be the cause of the asthma (39). These tests were negative. Likewise there were no reactions in his case to dusts and hairs (40). As there had been no history to make me suspect foods I began food tests with misgiving; and there were no reactions until after about forty tests (41). Buckwheat gave an extermely severe reaction making a hive (42) as large as a silver dollar and a two inch strip of lymphangitis, inside of an hour (43), from the site of the test on the forearm to the axilla; about as quick came an attack of hives from the waist up (44). There were no bronchial manifestations for several hours but within about twelve hours he had an extremely severe attack of asthma (45). As all previous tests had been so decidedly negative, the buckwheat was so marked in reaction, and he then recalled that he had been making it a practice for several years to have, about every two weeks, a "stack" of buckwheat cakes for breakfast, it was believed that he had a single sensitization (46). He came down soon, nevertheless, with another paroxysm of asthma. He was tested for what he had been eating and he reacted to pepper. Other attacks came and he was found sensitive to almonds. He was then tested for all foods and all reacters were eliminated (47) and he had no more returns of his asthma. I followed his case for several years. At one time he developed a severe cold and had sensations as though he might be going to have asthma (48). Treatment for the cold cleared it up in a few days without further bronchial trouble (49).

A baker by profession had dermatitis covering his entire body (50), with small abscesses especially about the face (51). His condition had existed for about nine months with no relief and the skin was thick and leathery (52). I suspected that the condition was the result of food sensitization probably from intimate contact with wheat (53). I succeeded in finding a few square inches of skin in one groin which seemed to be enough like normal tissue that I felt warranted in applying a small number of skin tests. There were no violent reactions, but there were several which seemed to react the least though most of them did react. Among thees negative reactions were lettuce and carrts (54) and he was sent to the hospital with the limited diet of lettuce and carrots; he made rapid improvement (55). A fresh crop of hives appeared soon after he entered the hospital and it took us several days to figure out that they were due to the orange juice (56) with which the nurse thoughtlessly gave the oil. The chief offender in his diet proved to be wheat with which (57) he worked and of which he ate freely although there were many reacters which had to be eliminated. His first reaction to wheat was weak and this kept getting stronger (58) on subsequent testing as he improved in health and as we kept him away from wheat. It was no easy task to persuade him to quit both eating wheat and working with it. This was necessary, however, before he recovered (59). He stayed away from the shop and refrained from eating wheat for between five and six months and then to our astonishment found that he could eat wheat without trouble (60) of any sort. After about five to six months of using wheat in his diet he again developed dermatitis (61). After another period of total abstinence from wheat we found that he could eat it in small amounts and even engage in handling the finished products of the bakery without trouble (62). Another observation on this man was that he had had asthma but never at the time he had the dermatitis (63).

A woman had dermatitis which affected

her entire body to such an extent that there was not even a pinpoint area of normal skin on which tests might be placed. The skin was indurated and thick (64), and resembled a raw beef-steak more than normal skin. This woman had lived in a mining camp upon a fairly limited diet (65). I selected a list of foods from those she had not been eating (66) and sent her to the coast for a month's recuperation. She returned definitely improved but far from well (67). I then gave her a full set of food tests (68) and eliminated all reacters from her diet (69) and in a short time she was entirely well (70). We concluded that peaches was the worst and probably her primary reacter (71). She had been eating peaches freely at the mining camp (72). The secondary reacters were added to her diet after about two weeks, one at a time, without any untoward results (73). After five weeks she ate a small helping of peaches and had no more serious trouble than pruritis in a small area on one leg (74). She afterwards recalled that she had had this area of pruritis early in her trouble before the dermatitis started and that this place was the first site of the dermatitis (75). She soon became able to eat peaches occasionally in small amounts without harm (76). She was also instructed to have as varied a diet (77) as possible; she has had no further dermatitis (78).

A dentist who does a great deal of extraction work by means of novocaine anesthesia developed dermatitis on his left index finger (79). We thought there might be a sensitization to novocaine but were unable to prove such. A complete set of food tests was made (80) and all reacters were eliminated from his diet (81). His recovery was prompt (82), even with the continuation of the use of the novocaine. Onions seemed to have been the primary sensitizer (83) but he had multiple sensitization (84). The sensitization to onion has persisted (85) though he is able to eat nearly all the other foods to which he reacted and which we proved would set up dermatitis (86)—preceded by pruritis. After several months he again began to have signs of dermatitis with the same finger, probably from relapsing in his diet and from the onion that he was unable to avoid (87) and I prescribed hydrochloric acid for him and the trouble subsided (88). After a period of taking the acid he is able to stop it and remains free of trouble for a time but soon has to resume it. He now recalls that as a boy he had dermatitis, not, however, on his index finger (89) and that the country physician to whom he went said he believed the trouble was from the stomach and prescribed hydrochloric acid (90). He recovered after taking the medicine for a relatively short time and had no more trouble for years (91). He also has mild hypertension (92).

A physician had pruritis of hands and wrists and occasionally of the feet and ankles for brief periods after meals in which there were certain articles of food (93). By elimination method he was able to prove that pepper and cucumbers were the worst offenders (94). Without these foods he would have almost no trouble (95) except when eating where it was not possible to avoid them (96). He was given hydrochloric acid (97) with his meals and at once observed that he could eat the offending foods with but little pruritis (98). After a few weeks of taking the acid he can discontinue it with no pruritis for a time (99) but must resume the acid again. This physician has also been afflicted with hay fever from bermuda grass. During a period of taking the acid he observed that the hay fever symptoms were improved (100). He had also had a chronic pharyngitis with ropy tenacious mucus in his throat after eating, as a rule, (101) which he incidentally observed disappeared while he was taking the acid (102). Stopping the acid allowed the mucus to reappear in his throat after eating (103). He also has mild anal pruritis which has responded to the hydrochloric acid (104) but which has not been completely relieved (105). I am also trying stomach coated pancreatin tablets with him, especially, hoping the anal pruritis will be cured (106), without the necessity of making the tests. He has mild hypertension (107).

A surgeon has had for years gastrointestinal distress (108) after eating, to such an extent as to cause him to eat with relatively little relish (109) and to be a hypochondriac (110) as far as eating is concerned. He has had mild rhinitis attacks which he believed came from dusts and possibly from foods (111). He had a few skin tests to which he gave only suggestive reactions (112). The physician who made the skin tests had a gastric analysis made and found him low in hydrochloric acid (113) and prescribed the acid for him. The acid relieved his gastrointestinal distress, gave him a relish (114) for his food, dissipated to a great extent that part of his hypochondria (115) and did away with many of his nasal symptoms (116). A small spot of dermatitis which he had had for years on his head cleared up (117). He also has a mild hypertension (118).

A woman with hypertension (119) devel-

oped asthma symptoms and a severe pharyngitis (120). Her food reactions are slight. She has been given an ephedrine cough syrup and the hydrochloric acid (121) mixture with excellent results on the respiratory tract symptoms (122) and suggestive benefit to the blood pressure.

A physician has been utterly incapacitated for work during the past six years because of tremendous pains in his head and face simulating migraine (123) and trigeminal neuralgia (124). Finding no pathology to account for the symptoms I tested his reactions to foods and found him multiply sensitized (125). An attempt was made to eliminate all reacters from his diet but with poor success (126) and he was then given the hydrochloric acid mixture with what appears to be definite improvement (127). He has a diminished hydrochloric acid of the stomach (128). He also has psoriasis (129) which has appeared since his other condition first became manifest.

A woman has a marked case of psoriasis (130). She has diminished hydrochloric acid (131) and definite reactions to a number of foods (132). She is now on a diet with none of her reacters in it (133) and is taking the hydrochloric acid prescription (134), with apparent improvement.

A man has had psoriasis for years (135). He has hypoacidity (136) and multiple sensitization (137). A woman has identical findings (138).

A woman had what was diagnosed as stomach ulcer (139) although the x-ray evidence was not conclusive. She had the alkali treatment (140). Subsequent x-rays disclosed a definitely spastic pylorus (141). She also had a gerat amount of gastrointestinal distress (142) for which it was difficult to account (143). She had most of her trouble after eating certain foods (144). A part of her complaint was due to what she called gas and bloating (145). Nearly any foods, she believed, caused her discomfort; but some were worse than others. She was unquestionably highly hypochondriac (146). A complete set of tests was made upon her and she was found to have multiple sensitizations (147). Following the intradermal tests for certain substances—notably, tomato, banana and lettuce—she had definite gastrointestinal symptoms (148) simulating her ulcer (149) and spastic pylorus (150) symptoms. All reacters were eliminated. By means of an abdominal section (151) pelvic abnormalities were removed, light adhesions about the pylorus and gall bladder were broken down and she has recovered (152). Her emaciation (153), her fear of food (154), her gastrointestinal symptoms (155) and her hypochondria (156) have nearly all disappeared. She eats with a delight and relish never before known by her (157).

A woman complained bitterly of gastrointestinal distress (158) which she designated as gas. She was given the hydrochloric acid mixture which she took for a time (159). She had prompt relief from the distress (160) and has had but little evidence of it since (161).

A woman had a gastric ulcer for which she had the alkali treatment (162). Her diet consisted also during the period of the active stage of the ulcer and for long afterwards of those foods which do not tend to stimulate the production of an excess acid in the stomach (163). A year after the ulcer and with no symptoms of typical ulcer she has a great amount of gastrointestinal distress (164) for which it is difficult to account (165). A prominent part of her symptoms are bloating and gas (166). She has marked hypoacidity (167).

A woman has had for a year, following a period of high nervous strain incident to caring for an invalid mother (168), a great amount of gastrointestinal distress—gas and bloating—(169) for which she has taken a great deal of soda (170) with questionable relief (171). She also has insomnia (172). Her gastric analysis shows a near achlorhydria (173). The x-ray suggests a diseased gall bladder (174). The food tests show multiple sensitization (175). She had hydrochloric acid (176) pending the study of her case and was improved to a moderate extent (177). She now has a diet with the reacters removed (178) and is taking hydrochloric acid and has had still greater relief.

A woman had a severe colitis (179) and gastrointestinal distress (180) with emaciation (181) and weakness (182). She has multiple sensitization (183).

A man with chronic pulmonary phthisis (184) has a severe colitis (185) a low gastric acidity (186) and multiple sensitizatio (187).

A woman had an uncontrollable cough apparently from a pharyngitis (188). I suspected a sensitization phenomenon and gave her a hypodermic of adrenalin (189) when I first saw her and sent an ephedrine (190) cough mixture and the hydrochloric acid (191) and the cough did not return after the treatment was begun with adrenalin (192). She thought the cure was almost miraculous as she had been hunting relief from physicians for nine months. Further study was desired but her relief was so complete that she could not see the need of it.

A physician's son had had asthma as a child from oatmeal (193). The boy grew up and went to college. By accident he ate oatmeal and wrote home in great glee to his parents that he could eat oatmeal without getting asthma (194).

A physician's daughter had asthma from egg (195). After several years with no treatment for desensitization the child was able to eat egg without asthma or other trouble (196).

A woman who had not been well but had no asthma, had all of her teeth extracted (197). She developed asthma within a few weeks thereafter (198). She was given the hydrochloric acid mixture (199) with marked relief (200). She was advised to get new teeth as soon as was expedient (201).

A woman had mild asthma. She had her teeth extracted (202) and shortly afterward developed severe asthma (203) accompanied with extreme faintness (204) and a disturbance in her pulse (205) in some of her paroxysms, which convinced the nurse that she was about to go "to her endless end," and she had multiple sensitizations (206) and a near achlorhydria (207). The worst reacters in her diet were eliminated (208) and she was given the hydrochloric acid mixture (209) with complete relief for a time. Later she developed an acute gall bladder infection (210) and had very severe asthma for a time (211). She had taken her acid in orange juice (212). A retest of some of her foods showed that she had become sensitized to orange juice (213).

A woman had asthma periodically (214). She had multiple sensitizations (215) and a low gastric acidity (216). She also had cholecystitis (217). She was given acid to take (218). She later had an attack of asthma with evidence of exacerbation of her gall bladder trouble (219). Her gall bladder was drained (220) through the duodenal tube and she has had no asthma since (221).

A man had asthma whenever he ate egg (222). On one occasion when he had eaten egg and became aware of it he exclaimed to his companions that he knew he was in for an attack of asthma. A chemist who was with him suggested that he might be able to give him something to prevent the development of asthma. A mixture of hydrochloric acid and pepsin (223) was prepared and taken and no asthma developed (224). He has always since carried a small vial of the acid mixture in his pocket (225) to take when the circumstances demanded it and has kept free of asthma (226). It was this story which crystallized my ideas in the advantage of helping digestion in sensitization cases.

A small boy was brought to me with asthma and as I dislike testing children for sensitizations I gave him the hydrochloric acid mixture (227) and within a few days he was completely relieved (228). Some weeks later after a bread and milk supper (229) the child developed extremely severe asthma (230). I advised the general diet (231) he had been having and the regular use of the acid (232) with the meals, on each taking of food (233). In a few days the child was well. He was brought to the office and I gave him three tests for milk and six for wheat and he reacted to every test (234). His mother was advised to eliminate both milk and wheat for a time (235) and to continue the acid. He was doing well at the last report.

A woman had extremely severe and persistent asthma. She had multiple reactions to food tests (236). Her reactions were so numerous that it was impossible to eliminate all of the reacters (237) and she did not do well (238).

A six-year-old girl had asthma whenever she had a cold (239). She gave multiple sensitizations to food (240). The reacters were eliminated from her diet (241) and she was given the hydrochloric acid (242) and she was relieved of her asthma (243).

Another small girl came in with asthma. She was given the hydrochloric acid mixture (244) and was markedly relieved (245). She was then tested for food reactions and a number of reacters were found (246). It had been observed that, in spite of the acid (247), certain foods gave her asthma (248). These were found to be reacters. The reacters were eliminated (249) and the acid was continued and she has remained free of asthma (250).

A woman was treated by Hall of Denver for asthma by the use of hydrochloric acid (251). She was relieved of asthma for months (252). When I saw her she was having asthma again. She had a low acidity (253) and hydrochloric acid was prescribed (254) but without apparent benefit (255). Her food reactions were slight (256). The reacters were eliminated (257) without apparent benefit (258). She was then studied further and bacterial sensitization was found (259). The proper vaccine gave relief (260).

A woman had severe sinus trouble (261) and extremely severe colds (262) in the winter time which were prone to run into asthma (263). She was completely tested (264) and no marked reactions were found (265). She had achlorhydria (266). She was given the hydrochloric acid (267) and told to take it indefinitely. She was also given a vaccine

of those bacteria to which she showed slight reactions (268).

A young man with practically a normal amount of acid in his stomach (269) had asthma whenever he had colds (270). He was given the acid mixture (271) to take during the winter. He had several colds thereafter and passed through them without asthma (272). He is now to take the acid only when he has a cold (273).

A young woman has extremely severe pains along the nerves with tingling and a great deal of numbness and other disturbing sensations (274). She also has much gastro-intestinal distress (275), at times with mental confusion (276) and prostration (277). There is a history of pernicious anemia on both sides of her family (278). She has near achlorhydria (279) and multiple sensitization to foods (280). Eliminating the reacters (281) has apparently done her no good (282). Giving her the hydrochloric acid has not helped her (283). Likewise giving her keratin coated tablets of pancreatin has been of no benefit (284). She is highly sensitive to bacterial proteins (285). She has a purulent condition of her biliary ducts (286).

Acid Tests of Fractional Extraction of Ewald Breakfast

No. 1		No. 2		No. 3		No. 4		
Free	Total	Free	Total	Free	Total	Free	Total	
10	29	0	10	13	28	25	50	Asthma
33	48	35	46	45	56	58	62	Psoriasis
0	10	0	10	12	24	12	24	Asthma
10	24	10	23	0	10	0	7	Enteritis
24	34	22	33	35	43	19	34	Psoriasis
0	10	—	—	0	3	4	10	Asthma
0	22	0	10	20	27	42	57	Asthma
0	18	7	14	15	28	25	40	Asthma
31	49	45	53	54	81	64	76	Asthma
0	6	7	20	34	45	39	58	Asthma
30	38	37	45	32	42	46	57	Asthma
40	50	33	42	46	60	28	36	Asthma
0	18	24	38	30	40	6	18	Asthma
0	19	0	10	0	16	0	16	Psoriasis
0	11	0	10	0	11	0	16	Enteritis
0	15	0	30	12	25	25	43	Psoriasis
0	8	0	8	0	2	0	4	Neuritis
40	66	35	55	43	61	57	76	Asthma
14	38	12	34	21	40	23	45	Asthma
—	—	10	19	0	—	—	—	Neuritis

DISCUSSION

I present these observations for the purpose of basing conclusions which have been forced upon me and, also, to record suspicions which have been aroused in my mind. Observations upon the perfectly obvious have been omitted. Likewise the hazy or not clear-cut observations have been omitted. I could have made the number of observations much larger.

Sensitization phenomena, it is apparent from my observations and as suggested by Duke and others, are more common than has been generally supposed, and may affect almost any part of the body. Observations 21 and 22 show that the joints may be affected; Nos. 24, 25, 26 show that the bladder may be involved; Nos. 27, 34, 50, 52, 56, 57, 61, 64, 74, 75, 79, 86, 87, 89, 93, 104, 117 show that the skin may be affected with dermatitis or pruritis or with both. Nos. 129, 130, 135, 138 suggest the possibility of a relationship between food sensitization and psoriasis. The etiology of psoriasis is a mystery and hence any plausible suggestion should be considered and proven or disproven.

Observations 36, 92, 107, 118, and 119 give the suggestion that hypertension may be a manifestation of food sensitization. On the face of it the theory does not seem unreasonable. The acute reaction of sensitization on the skin and on the mucous membrane of the nose and bronchi is an edematous swelling; one who has seen hives, hay fever and angioneurotic edema will not dispute this statement. The chronic dermatitis swelling results in an indurated non-elastic tissue as shown by observations 52 and 64. With the partially digested protein racing through the blood vessels, does it not seem rational that there should be a similar effect upon the endothelium, and deeper structures perhaps, of the blood vessels? The effect of such swelling would be expected to exert its relatively greatest effect upon the arterioles and capillaries. The small branches of the vascular system are held to be the site of the changes which induce hypertension. An enormous amount of work will have to be done however before positive conclusions are warranted. I have found one similar suggestion in the literature in an excellent article on hypertension by Dr. William Lintz.

Observations 100, 101, 102, 111 and 116 indicate that hay fever symptoms, coryza and colds may be accentuated and perchance even caused by foods to which one is sensitized. The coryzas and persistent hay fever symptoms are so common and distressing that any suggestion which gives promise of reducing the frequency or intensity of them would certainly be welcome to a host of sufferers. My observations warrant the suggestion that there may be help in this direction. My observations are few, for two reasons: I have not been awake to the possibility a sufficient length of time, and the average patient is prone to overlook the minor symptoms before treatment and their absence afterward.

In observations 101, 120, 188, 189, 190, 191, and 192 there is indication that pharyngitis may be the result of food sensitization. Extensive investigation of this point is warranted.

That anal pruritis results from food sensitization is substantiated by observations 104 and 105. There are references in the literature which have apparently proved that there is sensitization in many cases. In other cases reported the cause lies in other sensitizations than from food, such as from bacterial proteins.

Gastrointestinal distress and symptoms of various sorts thereof come from food sensitization. Duke and others have reported interesting cases. My observations indicate a variety of conditions; Nos. 109, 114, and 157 prove sensitization may cause a lack of relish of food; Nos. 139 and 149 suggest ulcer symptoms; 141 and 150 pyloric spasm; Nos. 108, 113, 142, 144, 145, 148, 155, 158, 160, 164, 166, 169, 177, 178, 180, 275 proved that general abdominal distress with gas and bloating may come from food sensitization; Nos. 179 and 185 suggest that mucous colitis may be a food sensitization manifestation.

From the gastrointestinal distress there may arise a fear of eating as shown in observations 9, 109, 110, 143, 144, 146, 148, 149, 150, 180, 181, and 182, that may lead to emaciation and weakness.

Observations 124, 274 indicate that neuritis and neuralgia may be provoked or caused by food sensitizations.

In observation 123 there is the suggestion that migraine is a manifestation of food sensitization. There are observations in the literature which prove this more conclusively.

That there may be an effect upon the brain, more or less general, is indicated by observations 33, 172, 204, 276, and 277.

The heart may possibly be affected by food sensitization as is suggested by observation 205. Usually when one part is affected there are no marked effects on another; but different parts may be affected in rotation as shown in observation 63; in other cases more than one part is affected at one time as shown by observations 35, 36, 79, 92, 93, 100, 101, 103, 106, 107, 108, 109, 110, 111, 119, 120, 121, 122, 123, 124, 129, 203, 204, 205, 274, 275, 276, and 277.

That the sensitization tendency is a hereditary factor is proven by numerous reports in the literature and by observations 12 and 13. That the sensitization process may be actually inherited is shown by observation 13. My records include a large number of cases with histories of familial sensitization phenomena.

That sensitization phenomena develop, ordinarily, months, years or decades after birth, is attested to by hundreds of reports, and shows conclusively that something happens gradually or suddenly to permit or to excite them to activity. I have one observation, No. 37, which bears directly and most suggestively upon the question. The young man upon whom this observation was made had always been well, or at least, reasonably well; he developed a fairly severe respiratory tract infection during the influenza epidemic of 1918-1919, which passed after a few weeks into asthma. Following that he had paroxysmal attacks of asthma, on an average of about once every two weeks; the attacks rarely lasted longer than two to four days. The duration of the numerous paroxysms, which we later proved came from eating certain foods, were remarkably short as compared to the weeks in bed with the initial illness.

Observations 18, 34, 37, 79, 151, 153, 154, 156, 174, 184, 210, 211, 217, 219, 220, 221, 239, 261, 263, 270, 272, 278, 286 and others indicate that colds or respiratory tract or other infections and pathology play parts in either setting up the sensitization activity or letting it become manifest. No clear history in many cases could be obtained of the initiatory attacks. Why should the dermatitis in observation 79 come on the index finger which was exposed to the novacaine and to mouths of patients when the previous attacks had been upon other parts of his body?

Regarding the subsequent attacks, when they are plainly food sensitizations, I have reasoned that the colds interfere with normal gastric processes so as to inhibit digestion or stomach motility, so that the foods have a chance to be absorbed into the blood before undergoing digestion to the state in which they are normally absorbed.

That helping the digestive apparatus by supplying hydrochloric acid does good is apparent from observations 20, 35, 88, 90, 91, 97, 98, 99, 102, 104, 113, 114, 115, 116, 117, 121, 122, 127, 134, 159, 176, 177, 191, 192, 199, 200, 209, 218, 223, 224, 225, 226, 227, 228, 242, 243, 244, 245, 250, 251, 252, 267, 271, and 272. The prescription which I have mostly used contains two drams of calcium chloride, three ounces of dilute hydrochloric acid, and sufficient quantity of an elixir lactated pepsin to make six ounces.

Sansum reports the use of pancreatin tablets, coated so as to escape the digestive action of the stomach ferments, with good results in several cases of asthma.

Dr. Eyermann reported to me last summer that he had been using hydrochloric acid in asthma with decided benefit in a fair proportion of cases. Through observations 90 and 251 it is shown that other physicians have used hydrochloric acid, apparently empirically, with good results and without reporting the result.

That the alkaline therapy for gastric ulcer may help to diminish stomach digestion, permit of absorption of undigested protein and perchance inaugurate sensitization phenomena, is shown, or at least suggested, by observations 140, 162, 170. With indigestion there is a tendency among a tremendously large number of persons to resort to the taking of one or several doses of soda with each attack, with doubtful value, as in observation 171; in many instances the indigestion is so persistent and the soda taking such a habit that the effect of alkali therapy in producing sensitization may surpass our ability to reckon.

Since the war the people have eaten less meats and as a result there is less stimulation of acid production, as in observation 63, than would result on a heavy protein diet.

That hypoacidity is a feature in many cases of sensitization diseases is indicated by observations 19, 113, 114, 128, 131, 136, 138, 167, 173, 186, 207, 216, 253, 266, and 279. See the table also for reports on fractional examination of a group of cases. Eyermann also reported to me that he has found that most asthmatics have hypoacidity. Since it is the whole protein which reaches the blood and being digested there causes the sensitization phenomena, it is obvious that any factor which interferes with digestion may predispose to the development of sensitization.

In observations 37, 48, 120, 239, 262, 270, and others, one may infer that something happens from colds to depress the function of the stomach and hydhochloric acid even added to the normal amount is sometimes beneficial. The observations 35, 342, 271 and others show that adding hydrochloric acid during the colds at least, may prevent the usual development of asthma with the colds.

It may be possible that the faulty digestion which admits of the development of sensitization phenomena lies within the duodenum rather than in the stomach. Sansum's results with pancreatin speak for this possibility. I am testing certain cases on pancreatin tablets coated so as to not be affected by the stomach. It has failed in observation 184.

That mastication of food is important is shown by observations 197, 198, 201, 202, and 203. It seems rational that food which is not finely divided will not digest with the same readiness, other conditions being equal, as one which is well and thoroughly masticated. Hurried eating may well be an important predisposing cause in the development of sensitization phenomena. It is also common experience to find asthmatics with poor teeth or inadequate teeth for mastication.

An important factor in the etiology or development of sensitization is the amount and the frequency of contact with certain articles of food, as is strongly indicated in observations 4, 23, 53, 72, 212, 213, 214, 229 and 230. The probable explanation of this phenomenon is that if a person eats a great deal of a certain food the chances of its getting into the blood in an undigested state sufficiently often to sensitize a person is more likely than when only a small amount is eaten and especially if infrequently.

My observations 53, 56, 57, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, and 76 give me the distinct impression, and it seems reasonable that such would be the case, that there are primary and secondary sensitizers. The primary sensitizers are also more persistent and enduring than the secondary sensitizers as is shown by observations 57, 59, 61, 62, 71, 72, 74, 83, 85.

Single sensitizations are rare. In observation 116 it was at first believed we had a single sensitization but this was soon disproven. Nos. 193, 195, 222 we may class as examples of single sensitization.

Multiple sesitization is common as shown by observations 5, 9, 10, 16, 25, 30, 41, 56, 67, 81, 84, 93, 94, 112, 125, 132, 137, 138, 147, 175, 178, 183, 187, 203, 215, 234, 236, 237, 240, 246, 280 and others. I have repeatedly found reactions to foods which the patients claimed they have never eaten. These observations are not reported. My explanations is that the proteins or their products are sufficiently related that a sensitization to one is a sensitization to the other.

There is one observation, No. 58, which indicates that during the severity of a reaction the primary and chief offender may have a relatively weak reaction when tested upon the skin and as the manifestations of the sensitization phenomena disappear the skin test becomes more positive. I think I have seen evidences of this in several cases but none of the reactions were clear cut with the exception of the one cited. The explanation of this would be that enzyme P was completely exhausted and hence the protein could be injected and it would not be digested sufficiently to react or cause trouble.

When a certain tissue or even a certain

locality becomes involved the tendency is for that same area to remain the site of the trouble unless it spreads by contiguity from there. There is proof of this theory or statement in observations 74 and 75. Dermatitis is prone in an early and mild stage to manifest itself in pruritis or pruritis is prone to run into dermatitis; to substantiate this there are observations 74, 75, 86, and 93.

That the skin tests are not always capable of showing conclusively what the causes of sensitization reactions are is shown by observations 1 and 2, 7, 264 and 265, also by a number of others.

On the other hand some skin reactions may be extremely severe. Note observations 42, 43, 44, and 45. In this incident the skin reaction promptly became a lymphangitis and rapidly extended to the axilla in a band at least two inches in width. Inside of thirty minutes hives involved the body from the waist up. I have not been able to explain why only above the waist. In about twelve hours severe asthma was present. This indicates that the part of the protein molecule which caused the skin evidence in the forms of lymphangitis and hives was different from that which caused the bronchial reaction or asthma. The twelve hours may have been necessary for splitting up the product to the stage to which the bronchial mucosa was sensitized. It is a common experience that many reactions on the skin come only after hours and then as inflammation rather than hives. The suggestion arises from these observations that the test which produces a reaction—hives or inflammation—which endures the longest is likely to be of the greatest importance unless there is too much difference in the severity. A severe reaction of short duration is probably not as important as the moderately severe reaction which lasts a long while. I make it a point to keep track of the reactions and record them for the length of time which they endure. Another point suggested by these various observations especially in multiple sensitization, is that the reaction from one substance may come upon top of another reaction and produce a serious result just as 2, 2 and 2 make a half a dozen the same as does six.

Complications exist in asthma and usually consist of multiple sensitization as noted by many observations already discussed. On top of the sensitization may come infection as is evidenced markedly in observation No. 51. It is important to treat colds, focal infections and all existent pathology but this should be done conservatively. See observations 49, 221, 151, 152.

Bacterial, pollen and other sensitizations should be searched for as indicated in observations 38, 39, 40, 254, 255, 256, 257, 258, 259, 260, 283 and 285.

Many tests may be made before a reaction is found as shown in observations 38, 39, 40, 41 and others. I recall one case who gave profoundly negative reactions, until many over a hundred tests had been applied and then there was one reaction only. As a matter of fact at that time I had applied all the tests I possessed and just by chance thought of pertussis. As this woman was well over sixty it seemed unlikely that pertussis bacilli would give a reaction. They did. Subsequent results proved that pertussis bacilli were the cause of her trouble; the vaccine cured her.

It has been shown in certain instances, as observations 14, 15, 35, 98, 223, 224, 225, 228, 232 and others that a digestant gives complete relief from sensitization and helps to make the diagnoses. It is preferable to make the tests, however, and it is often necessary as shown by observations 5, 9, 42, 57, 66, 68, 69, 70, 80, 81, 82, 102, 133, 178, 234, 235, 237, 241, 247, 248, 249 and others.

The treatment of food sensitization theoretically is simple and consists in eliminating the reacting foods from the diet. As shown by the observations already referred to, however, there may be such a group of offenders, sensitizations may reverse so readily, and food tests may not be sufficiently positive, that it is difficult or impossible to decide what foods to eliminate, as in observations 96, 238, 281, 282, and others. An extremely rigid diet with all reacters eliminated, as observations 54, 55, 59, 69, 95, produces prompt results.

If my observations 5, 31, 32, 35, 60, 62, 73, 74, 76, 91, 117, 157 and 161, 194, 196 are correct, a person may be desensitized to food by not eating that food for a period of time—greater in some cases than in others. I have suggestive evidence in food tests which substantiate this conclusion,—but I have been unfortunate in having opportunities to recheck reactions as I have wished. The evidence is unmistakable that the persons who refrain long enough from the eating of their sensitizers, in a fair proportion of instances, do get able to eat those foods in small amounts provided they are taken infrequently. It has become a conviction with me that it is best to eliminate all reacters irrespective of the amount of their reactions. Therefore, it is wise to use sensitive testing methods. As shown by observation No. 8 the intradermal is preferable to the scratch method. The food elimination method, as shown by observation No. 11, is

still less reliable than the scratch test method. As detailed in a previous paragraph, it seems that the eating of one food may keep up a reaction to a food which is not included in the diet at all. I have thought that this explained the reason for the general belief that one never recovers from a sensitization that is once definite. Foods like wheat, milk, onions, eggs, pepper, mustard, etc., are so generally used in cooking that it is difficult to escape getting small amounts without the most careful efforts on the part of all concerned in the preparation of foods. Since using the digestants in the treatment of food sensitizations, I have considered it unnecessary to be as strict about eliminating all reacting foods as before. Whether this will prove to be correct or not remains to be seen.

After desensitization to a food results, it should be the rule at least for a long time to eat the reacters sparingly and infrequently as in observation No. 34. To avoid new sensitizations it is well to use a varied diet as in observations 77 and 231.

My ideas about using aids to digestion go back several years. They were not crystallized into practical benefit until something over a year ago when I contacted the man upon whom observations 222, 223, 224, 225, and 226 were made. Since that time I have used the acid, pepsin and calcium mixture in a large number of cases and with a strikingly large number greatly benefited. The use has been in a part of the cases without consideration as to the amount of acid the patient had in his stomach Note observations 269, 270, 271, 272, and 273, where the results were good even where gastric analysis showed normal acidity.

I wish to give credit to Dr. Eyermann for priority in testing for the amount of acid in the patients' stomachs. I have now run the fractional tests for gastric acidity on a considerable number of cases with one or another type of sensitization process and have found that there is a distinct tendency for sensitization cases to have low gastric acidity and in a few cases a near achlorhydria (see gastric analyses table). In children and in the aged it is not feasible to make gastric analyses and I have not hesitated to give them the mixture, which I use, on an empirical bases.

I do not know whether the giving of the pepsin adds to the efficacy of the acid or not. Neither do I know whether there is virtue in the calcium which I have generally used. It has seemed that calcium iodide works better than calcium chloride. In some cases I have used the acid by itself, perhaps with as satisfactory results as where the whole mixture was used.

I make it a point to treat whatever is found to be pathologic about every patient, if it is at all expedient and not definitely inadvisable. Focal infections may well be the cause of food sensitizations, if my views are correct, and hence should not go untreated. It is advisable to undertake operative procedures conservatively and only after the patient has made all the progress which can be reasonably expected under the treatment up to that point.

Regarding the diet for sensitization cases, I advise the most general and varied diet possible. No food is to be eaten regularly, one meal after another, where it is possibe to do differently. No food is ever to be taken alone and in large quantities unless for some definite reason. For breads, for example, one may have wheat, rye, corn, lima bean flour, buckwheat, etc. It is easy also to vary the fruits and vegetables and meats. Milk, cream and butter are not so easy for which to get substitutes.

If bacterial sensitizations exist, and they do in some cases, they should be treated along with the treatment of food sensitizations.

The heart, especially in asthma, should have careful and frequent examinations and digitalis in sufficient dosage when indicated. The heart is prone to be dilated in asthma so well as in other chronic conditions.

Whenever the result is far more serious than the discoverable causes seem to warrant, or the finding is difficult to account for, as in observation No. 165, it is wise to suspect sensitization phenomena.

ARIZONA NEWS ITEMS

DR. WALTER P. SHERRILL, formerly of San Diego, Calif., has moved to Phoenix, with offices in the Luhrs Building. He will specialize in pediatrics. Dr. Sherrill is graduate of Cornell University, class of 1925.

DR. LEWIS H. HOWARD, graduate of University of Maryland in 1916, has moved to Tucson from West Virginia.

DR. EDWARD M. HAYDEN, formerly of Wisconsin, has moved to Tucson, where he will be associated with the Desert Sanatorium. He is a graduate of the University of Minnesota, class of 1925.

DR. LOREN C. BARLOW, formerly of St. Louis, graduate of Washington University, has located in Phoenix, with offices in the Goodrich Building. His field of work is general surgery.

DR. JOHN C. MAUDLIN, formerly in the U. S. Indian Service at Komatke, Ariz., has moved to Phoenix, where he will engage in general practice. His office is at Third Ave. and Roosevelt St.

DR. PALMER DYSART, son of Dr. Louis Dysart of Phoenix, has accepted the position as resident physician at St. Joseph's Hospital, Phoenix for a year, following which he will be associated with his father in practice in Phoenix.

CARCINOMA OF THE BREAST

(PATHLOOGY)

WILLIS W. WAITE, M. D.
El Paso, Texas

(Read before the El Paso County Medical Society, March 25, 1929.)

There is very little a pathologist can say about carcinoma of the breast other than what can be found in the text-books.

First, we might ask why there are so many carcinomas in an organ so easily accessible. For this there is no apparent reason. The breast originates from the germ layer and is comparable to the skin glands, but is more highly specialized and has a more important function to perform. When we consider that it develops rapidly at puberty, undergoes more or less change every menstrual period, markedly hypertrophies during gestation and lactation, again atrophies or involutes following the menopause, and, besides, is subject to injury and inflammations of many kinds, it is not so surprising that carcinoma may result.

The changes that may be forerunners of carcinoma are chronic cystic mastitis and fibromas and fibroadenomas. In the cystic mastitis, there may be one or several nodules or cysts. When the cyst is solitary, of some size and buried in fat, it is difficult to distinguish from carcinoma. These cysts often present a blue appearance when examined by incision and are known as blue dome cysts.

Authors are not agreed as to the proper treatment for this condition. If only one cyst is removed, others are likely to develop later and the possibility of carcinoma being associated with a bunch of cysts cannot be excluded. In such a case I believe it best to remove all the breast tissue and examine it carefully at the time of operation. If any nodules of cancer are found, the complete operation should then be done. In one such case where the largest mass of cysts was removed, nothing malignant was found, but when the rest of the breast was removed, there were other small cysts and one nodule about the size of a small pea which was cancer. The complete operation was immediately performed and a perfect result obtained. Had the cancer nodule been left until the patient was aware of its presence, a cure could hardly have been expected.

As to the adenomas, fibro-adenomas, etc., there are several different types and they may be solitary or multiple. These seldom show dimpling, retraction of the nipple, or fat atrophy, and seldom give pain. All such tumors should be removed and examined at the time of removal. Grossly, these tumors are quite characteristic and it is very seldom that a microscopic examination need be made in order to make a diagnosis, so there need be no delay at the operation.

In dealing with all breast tumors, it would be a good plan to be prepared for the worst and expect to find the best. If one is not prepared to go ahead immediately, following a removal of a breast tumor which proves to be malignant, he is in a serious condition, jeopardizing the life of his patient unnecessarily.

As to the diagnosis of breast tumors, no one can diagnose the borderline cases without removal, and it is in this group that correct diagnoses will be of value. Therefore, there is only one thing to do when a breast tumor is found in a woman past twenty-five and that is to take it out as soon as arrangements can be made to do so. The tumor should not only be taken out; if the surgeon is not well grounded in pathology, he should have available some one who is, to examine it immediately, and be prepared to go ahead with the complete operation at once if the case proves malignant. In following this method lies our only hope of reducing the mortality of cancer of the breast. Every physician, when he examines a woman for any cause, ought to go over the breasts as to what should be done and this advice should not be, "Oh don't worry, it is probably nothing important; let's wait and see, maybe it will clear up of itself," etc., etc. Such advise is worse than useless, as it robs the patient of her only chance of a cure.

There is no use expecting cures in those cases that anyone can diagnose at first sight as malignant. The diagnosis is difficult, the treatment is easy, and where the diagnosis is easy, there is practically no cure. There are certain fulminating cases in rather young people that no one sees early enough to reach. However, we ought ever to be on the alert and watch for early changes in every breast. This, I think, is the most important message the pathologist has to bring and the only one that offers any hope. Find all tumors of the breast early, get them out as soon as possible, in most cases before they are malignant, and thereby effect a cure.

SURGERY IN CANCER OF THE BREAST

W. L. BROWN, M. D. and C. P. BROWN, M. D.
El Paso, Texas

(Read before the El Paso County Medical Society, March 25, 1929.)

The female breast being one of the three lymphatic centers of the surface of the body —the others being the axilla and groin— makes dissemination of cancer from this organ the most frequent of any location in the body. Upon this primary anatomical fact is based the surgery applicable to the disease.

That cancer may be transmitted through the blood has been conclusively proved, but that is not its usual highway of travel.

Twenty-five years ago Charles Mayo emphasized the fact that "the lymphatics reach the height of their activity in adolescence and, like the tonsils, the spleen, and other lymphoid structures, slowly retrogress, thus explaining the relative curability, decade by decade, of carcinoma in the aged, as contrasted with the rapid growth of malignant disease in the young." Also, the lymphatics of the breast are much more active during pregnancy and lactation; hence the greatly increased malignancy of cancer during that period.

A study of the anatomy of the lymphatics of the breast and their drainage areas, explains to a fair degree the rather definite areas of metastases and their sequence.

There has been considerable written to show that cancer originating in certain quadrants of the breast would metastasize to certain definite areas. The breast, however, has such a network of lymphatics that this rule does not have a great deal of practical application.

The first to become involved are the mid-axillary glands, then those along the axillary veins, then the subclavian and the supra-clavicular.

If the two upper quadrants of the breast are involved, and the skin is involved, the glands above the clavicle are almost certain to be involved, as the skin lymphatics pass in front of the clavicle directly to the glands.

Ewing states that "the position of the tumor is often of importance; that the most favorable position is at the nipple."

One of the earliest cases of inoperable axillary metastasis that we have ever seen, was a cancer at the very lowest margin of the breast at the mammary fold. The entire groups of sub-clavian and axillary glands had progressed to such an extent that the axillary vein was already involved, and removal was impossible in four months, with primary tumor size of a filbert.

The metastasis towards the axilla has attracted so much attention during the development of surgery of cancer of the breast, that the very important and fatal drainage areas through the chest wall, accompanying the blood vessels into the mediastinum, subcutaneously into the opposite breast and axilla, and downwards through the upper abdominal wall into the round ligament of the liver and abdominal organs, have been neglected or overlooked. This anatomical fact simply means that it is absolutely important to take all the subcutaneous tissue and fat, well over to the mid-line, extending the incision to the xiphoid cartilage, likewise removing all the subcutaneous fat and fibrous tissue.

It would appear that the limits of the operative field in cancer of the breast have been reached. There is general agreement as to the field just outlined, but there is no general agreement as to the attack on the supra-clavicular triangle as a routine procedure. It adds considerable difficulty to the operation. There is an area between the infra-clavicular and supra-clavicular spaces that is covered by the clavicle, sub-clavian vessels, and brachial plexus, which makes thorough removal very difficult. On the other hand, almost all surgeons are agreed that if the supra-clavicular glands are already involved, the case should be looked upon as inoperable. Thus, we see the great importance of the lymphatics of the breast, and the drainage areas, in surgery of the cancerous breast.

Ewing states: "From clinical and pathological studies, I have drawn the impression that, in dealing with mammary cancer, surgery meets with more peculiar difficulties and uncertainties than with almost any other form of the disease. The anatomical types of the disease are so numerous, the variations in clinical courses so wide, the paths of dissemination so free and diverse, the difficulties of determining the actual conditions so complex, and the sacrifice of tissue so great as to render impossible, in the majority of cases, a reasonably accurate adjustment of means to ends. The scope of the operative field having apparently reached the limit, the chief hope for reduction in the mortality from mammary carcinoma lies in its prevention and earlier diagnosis."

So long as the operative field has reached its limit, and earlier operation upon all breast tumors is at present the only hope of decreasing the mortality from cancer of the breast, it becomes necessary to emphasize again and again the importance of learning all there is to be known about every lump in every breast at every age, with absolutely no exceptions.

It is still disheartening to have women come with lumps in their breasts which they themselves have been aware of for months, and, in many cases, the doctor has been watching for developing symptoms of cancer, which, when developed, have left practically no chance of cure for the patient. One other suggestion along this line would be to include, as a matter of routine, the breasts of all women during a general examination.

There has been considerable discussion about the advisability of doing biopsy on the breast. As a general rule, no tumor of the breast should ever be cut into to secure laboratory material. All tumors should be removed, but not cut into. If the tumor is of very considerable size and there is still doubt as to its being cancerous, then it is permissible to remove a section with the cautery, going ahead immediately with the operation upon receipt of the report from the pathologist.

As there is no age at which cancer may not develop in the breast, all definitely defined lumps in the breast should be completely removed for laboratory diagnosis. One should be very certain that the tumor is cancerous before the radical operation is done.

The uncertainty of the ultimate results of surgery is shown in the fact that the same surgeon may do the same radical operation in apparently the same kind of case, in the same location, and one case bring about a cure, and another do absolutely no good.

Advanced cases of carcinoma of the breast very often have their lives shortened by the radical operation. I think this is generally agreed.

Cancer of the breast during pregnancy usually runs a very rapid course. One reason why it would appear worse is because it is in the younger women. Inflammatory forms of cancer, where the symptoms are ushered in by fever, redness, and acute inflammation, run a very rapid and fatal course, and should not be operated upon.

When the axillary glands are fixed, when there are supra-clavicular glands, when the breast is fixed to the chest wall, when there are metastases into the abdominal viscera, chest, bones, or spinal column, radical operation is absolutely contra-indicated.

We shall not undertake to describe the various operative technics which may be found in any book on surgery.

We are decidedly in favor of the incision that permits a complete dissection of the axillary, sub-scapular and sub-clavicular spaces before any attack is made on the breast or before the breast incision is made.

For that purpose we much prefer the Halsted or Jackson incision; more recently, we have used the Halsted altogether.

It is extremely important that the dissection be made without excessive pulling or trauma, as many believe that cancerous cells may be forced into the circulation.

The branches coming off of the axillary vessels should be thoroughly cleaned before they are clamped and tied, leaving no fat or areolar tissue in the knot.

The dissection should be made as completely as possible with a knife or cautery and not by dull dissection. As the dissection progresses, the incision is gradually extended to include the breast. We have often found glands far around toward the back, under the sub-scapular muscle.

The late Dr. J. B. Murphy taught that it was not necessary to remove the pectoral muscles, as he had never seen a recurrence in them. However, it is necessary to resect both major and minor pectoral muscles close to the humerus and clavicle, to properly expose the axillary space. Because of the fact that the lymphatic vessels penetrate these muscles to reach the deep glands, and because of the fact that their fascia carries lymphatics, and lastly, because of the fact that their loss does not cause a great deal of crippling of the arm, we feel it is safer to remove them as a routine in all cancers.

After the muscles are resected, the axillary and sub-clavicular spaces thoroughly exposed and dissected and the sub-scapular space cleared, we then complete the breast incision and take everything right down to the chest wall, with all the fat, well over to the mid-line and well down to the xiphoid cartilage, the entire removal being en masse.

In this technic, we think there is considerably less hemorrhage and the shock is reduced, because the large denuded area is not exposed until we are practically ready to suture the skin.

We have never felt quite competent to make a thorough dissection of these spaces in close proximity to the large vessels and nerves, with the cautery. In the hands of those who are thoroughly familiar with its use and are unafraid, it is probably very commendable.

If the skin is involved, it adds greatly to the prospective mortality and a very large area should be taken at an operation, regardless of whether there is enough left for approximation. In the average case, where the skin is not yet involved, quite sufficient may be preserved for a complete closure, without expectation of local return.

THE VALUE OF X-RAY AND RADIUM IN THE TREATMENT OF BREAST CARCINOMA

J. W. CATHCART, M. D.
El Paso, Texas

(Read before the El Paso County Medical Society, March 25, 1929.)

Repeatedly we have seen carcinomas of the breast decrease in size, open ulcers heal and metastases shrink, with, in each instance, a decrease in pain ,accompanied by improvement in the patient's condition—all as the direct result of radiation (and by radiation is meant x-ray and radium). Therefore, we cannot but feel that radiation has a definite, established place in the treatment of breast carcinomas, and believe that this agent has, and will assume, a vastly more important role in the future than it has heretofore been accorded. It is, therefore, the purpose of this paper to emphasize the value of this method of treatment.

In support of radiation therapy, we should like to quote from several well known men.

John G. Clark, of Philadelphia, who, we all know, is an authority on this subject, has made the statement that "to discard or fail to use radiation as an adjunct to surgical measures, in the face of the available statistics, should lay the operator open to a charge of criminal negligence." This language may seem a little strong, but a review of the literature will show that it is well founded on statistics.

Dr. Burton J. Lee[1], who was recently here and addressed this Society, established a "breast service" in 1919, at the Memorial Hospital, New York, to concentrate under a single head the work in this field for the study and treatment of malignant tumors in their many and varied phases. He states in this connection: "All in all the outlook in the treatment of carcinomata of the breast by radiation is a most encouraging one. We feel that in no case of mammary cancer treated by surgery can the proper use of x-ray radiation be discarded. Radiation properly administered is the most effective aid in the case of a carcinoma of the breast surgically treated; and in every surgical clinic, a preoperative and postoperative cycle is to be employed if best results are to be obtained. We know that surgery has something very definite to offer for the relief of carcinoma of the breast, but we also feel that a careful follow-up of these cases in the surgical field may reveal a much poorer percentage of five-year cures than is generally believed. Our own conviction is that, of 100 cases treated surgically, fifteen to twenty-five per cent may be expected to be alive at the end of five years."

The statements of Dr. Lee are well borne out by figures compiled by Dr. U. V. Portmann[2] of the Cleveland Clinic, Cleveland, Ohio, who states that, while it is generally accepted as a fact that the average natural duration of cancer of the breast is thirty-four months, and the records of numerous clinics would seem to indicate that about the same number of first year recurrences follow surgery and x-ray, as where surgery alone is employed, yet, when we take a long range view, it is observed that the combination of surgery and radiation gives about five and one-half per cent more patients who survive the five-year period. Not a very large per cent—but I judge we would consider it quite important if one of our own was included in the five saved by radiation.

Table of Cases Compiled Since 1924.
Cleveland Clinic, Cleveland, Ohio.

CANCER OF THE BREAST

Treatment	No. of Cases	Recurrence first post op. year	Recurrence during 1-3 year period	Living without rec. 1 yr.	Living without rec. 1-4 yrs.
Surgery	50	12-24%	18-36%	20-40%	12-24%
Surgery plus X-ray	61	11-18%	13-21.3%	37-61%	18-29.5%

Dr. D. T. Quigley, of Omaha, states that by preradiating they have cut down their first year recurrences in the non-encapsulated breast cancers from seventy-five to twenty-five per cent. Emil Beck, of Chicago, who uses preoperative radiation and leaves the wound open for post-operative radiation, claims eighty per cent living after five years, whereas the general average for clinics all over the world is but thirty-three per cent.

And further, as to the value of radiation, I desire to quote from the 1928 Report of the Section of Radiology, Mayo Clinic[4], as follows:

"Dr. A. U. Desjardins: Radiotherapy is slowly emerging from the experimental stage as greater experience with this method of treatment increases knowledge of its possibilities and limitations. The two factors which are most hampering to improvement are, on the one hand, the over-enthusiasm of certain radiologists who exaggerate the possibilities, and, on the other hand, the ignorance and prejudice of many physicians, often the very leaders of the profession, who exaggerate the limitations of the method. Both of these hampering factors are the result of ignorance. However, as time passes, this ignorance on both sides is diminish-

ing, and radiotherapy is gradually finding its proper level. For the reasons set forth in the preceding paragraph, the Clinic would not be justified, on scientific grounds, in deciding arbitrarily to give postoperatively in malignant conditions only one course of treatment. To assume such an arbitrary attitude would immediately set us at variance with the scientific work of the best institutions. In connection with carcinoma of the breast, we have been working for some time on the following basis: a single course of postoperative treatment is given in those cases in which pathologic involvement of lymph nodes was not found at the time of operation, and three courses of treatment at intervals of three or four weeks, in those in which pathologic involvement of lymph nodes was present at the time of operation. We have been willing to try out this scheme to see what the results will be in comparison with those obtained by institutions and high-grade individual workers who are giving from three to twelve postoperative courses of treatment after radical amputation of the breast for carcinoma. If postoperative radiotherapy is to be used at all, it seems to me that it should be used in the manner best calculated to yield maximal effect."

That postoperative radiation is of value seems pretty generally accepted. Until such time, however, as more statistics have been compiled and checked, we shall feel that the radiologist has no quarrel with the surgeon who operates and then sends the patient for postoperative radiation. However, we cannot but express our own conviction that the patient who receives radium and x-ray treatment two weeks before undergoing a breast amputation has a better long range prospect than she would have without the radiation.

Breast malignancies, as they present themselves, to the radiologist, naturally divide themselves into four classes:

a. Operable,
b. Inoperable
c. Postoperative,
d, Postoperative recurrences.

In our classification we have followed that set forth by Dr. Lee, and would class as operable a tumor of the breast when:

1. It is freely moveable over the chest wall;

2. There is no glandular involvement other than the axilla on the affected side;

3. There are no other demonstrable lesions.

As inoperable would be classed a breast tumor in which any one or more of the following factors were found:

1. Fixation of the breast tumor itself to the chest wall;

2. Involvement of the supraclavicular nodes;

3. Definite involvement of the opposite axillary nodes;

4. Diffuse subcutaneous nodules;

5. Diffuse inflammatory carcinoma, involving a considerable skin area;

6. Chest metastasis, pleural or mediastinal;

7. More remote metastasis.

The two other conditions, postoperative radiation and postoperative recurrences, need no amplification.

When and how to radiate, is the next vital question. In considering a breast carcinoma from a radiological point of view, it is necessary to bear in mind the lymphatics of the breast. Anatomists tell us there are five lymphatic systems in the breast.

These five systems all anastomose freely. The largest amount of lymph, under normal conditions, is returned to the body by way of the axilla. When a carcinoma is forming in the breast, it is surrounded by an increased zone of lymph, as a result of the localized mastitis. This lymph may or may not contain cancer cells. As this inflammatory lymph reaches the axillary glands, they become enlarged and, in most instances, the enlargement may be such as to cause a complete obsruction of lymph channel. This backing up of the lymph stream causes the collateral circulatioin to open up new channels. Hence, the setting up of metastasis in locations not usually considered drainage areas of the breast. Metastasis may take place upward into the glands of the supra and infraclavicular spaces, into the thorax and thus into the mediastinum and lung branches; through the thorax and communicating with the other breast; also through the skin lymphatics across the sternum and into the opposite axilla.

Thus we see that, in radiating a breast for malignancy, it is necessary to extend the radiation area far beyond the confines of the breast and the areas accessible to the surgeon. It is known that blood has a certain destructive power on epithelial cells and it is probably because of this resistance that fewer metastases spring up from material carried in the blood than in the lymph streams. It is thought that this resistance in late stages and when patients become cachectic, has broken down; for that reason during the late stages of the disease numerous metastases take place in remote parts of the body. It therefore becomes essential that the patient's general health should re-

ceive consideration, first, last and all the time, if she is to overcome or limit the spread of her disease. Any treatment that has a tendency to unduly lower resistance, or affect the general well-being of the patient is contraindicated. This applies to the application of radiation as well as other agents, and I might add that we do not hesitate to use any treatment we believe beneficial to the general health.

In mapping out areas for chest radiation, we are accustomed to use five ports of entry. The most important area is that of the upper axilla and supraclavicular area. Here it is advisable to use the higher voltage x-ray, 180 k. v. 50 cm. distance filtered through ½ mm. copper and 1 mm. aluminum, pushing the treatment to the maximum of skin tolerance, then dropping down over the breast areas, using less penetrating rays because of the possibility of damaging the pleura and lung. The lateral chest walls and axillary spaces receive an erythema dose of 140 k.v. through 4 mm. of aluminum at 38 cm. distance. We are also in the habit of placing radium packs over the sternoaxillary margin and supraclavicular region on the affected side. If we are privileged to see a case before it is operated upon, we advise preoperative radiation as we believe it is possible to sterilize the lymph zones and render dormant the cancerous growth. If a patient has been operated upon, then radiation should be given two to three weeks after operation, and repeated at least twice at intervals of four to six weeks. In a case where the malignancy has extended beyond the breast, three or four series are advisable.

For the inoperable cases, radiation offers some palliation, but over-radiation must be guarded against; especially is this true in the application of buried radium when it is placed near important nerve trunks, as in the axilla or neck.

As to surgery in the inoperable cases:

Dr. A. C. Scott, of Temple, Texas, now takes the position that surgeons have made a bad reputation for themselves by operating upon utterly hopeless cases, and that every effort should be made, before operating, to find if metastases have taken place. If metastases are present, then operation should be performed only for relief of pain or a foul sloughing wound. If this position is taken generally by surgeons, it will, in our opinion, cause an awakening of the public conscience that will result in earlier cases coming to operation and a consequent lowering of the mortality rate.

For the postoperative recurrences, if they are freely moveable, surgical removal preceded by radiation or at least followed by radiation, is the method of choice.

Recurrent inoperable carcinoma of the breast constitutes by far the largest group of cases seen by the radiologist and it is in this group that the real suffering is seen. With swollen arms, tumor masses in the axilla, neck, sternal region, growths in the pleura and throughout the lung, with a constantly harassing cough, small growths appearing in the skin, accompanied by stinging sensations, often with visceral metastases, these patients are a pitiful group and any relief we can give to their suffering bodies and disturbed minds is truly practicing medicine. It is not our practice to attempt destruction of all these various lesions, but rather to pick out those causing the greatest suffering and try to bring about amelioration of the symptoms.

There have been many changes in the technic of radiation. Probably the greatest mistake was the use of the high voltage cross-fire technic, such as is used in treating malignancies of the pelvis. This technic will undoubtedly show up badly when the five year statistics covering that period are being compiled. The technic most generally employed at the present time has already been described and with this we are enabled to accomplish good results.

PROGNOSIS

As to prognosis in breast carcinomas, from a clinical point of view we know of no way to derive a more accurate conclusion than by the use of the clinical index for carcinoma of the breast outlined by Dr. Lee[5]. Dr. Lee has clearly shown that by this means he has been enabled to arrive at a prognosis, with results even more accurate than those obtained from the sections by the pathologists. This method has the added advantage that it is always at hand and may be very quickly determined. While we have not used this clinical index heretofore, it is our intention from now on to apply it to each case.

For your information the chart is as follows:

Lee's Clinical Index for Breast Carcinoma

			Over 55	= 1
Age	A = 2	Ag	41-55	= 2
			40 or under	= 3
			Absent	= 0
Lactation	L = 3	Lg	Present	= 3
			Slow	= 1
Rate of Growth	R = 4	Rg	Moderate	= 2
			Rapid	= 4
			Small	
Extent of dis-	E = 5	Eg	3 cm. or less	= 1
			Large	= 2
			Nodes present	= 4

Multiply the gradation factors as they apply to each case by the weighting factors and add the totals. Based upon such a calculation, patients may be placed in one of the three grades:

Grade A. 11 to 25—relatively benign.

Grade B. 26 to 39—moderately malignant.

Grade C. 40 to 55—highly malignant.

Reviewing our own cases we find that, in the last ten years, we have radiated eighty-nine cases of breast carcinoma. Only seven have been radiated before operation and those too recently to be of statistical value.

The cases represent references from thirty-three physicians. In most instances the cases are sent for radiation for inoperable recurrences or shortly after operation. No data are available as to the character or extent of the dsiease. Nor have we any information as to the subsequent history of the cases after they were returned to the referring physician. Our records are thus so incomplete that they have no statistical value.

As a result of Dr. Lee's recent visit, I am in hopes that some system will be found whereby all the facts pertinent to a case may be collected and tabulated and made available for study. If we had such an arrangement, we should certainly be in a much better position to draw conclusions that would be of real value, rather than having to rely entirely on the statistics of others supplemented by clinical impressions.

CONCLUSIONS

1. Radiation has a definite place in the treatment of breast carcinomas.

2. Preoperative radiation of operable breast malignancies will, we believe, give the largest number of five-year cures.

3. Postoperative radiation should be administered for at least two cycles—one about two or three weeks after operation; the other, after a lapse of four weeks. If the malignancy had extended beyond the breast at time of operation, then at least four series of treatments should be given.

4. Cases of inoperable recurrent breast carcinoma may have suffering decreased and lives prolonged by radiation.

5. A reasonably accurate prognosis can be made in each case by use of the Lee clinical index.

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LOCALIZATION OF DISEASES AND INJURIES OF THE BRAIN AND SPINAL CORD.

(With Presentation of Illustrative Cases.)

S. D. SWOPE, M. D.
El Paso, Texas.

(Read before the El Paso County Medical Society.)

The localization of injuries to, and diseased areas in, the human brain and its distributing nerve trunks, is one of the most interesting and difficult tasks that diagnosticians and pathologists have to encounter. "The whole cortex of the brain, in great part, is a huge storehouse of memories. These memories are grouped together so that those which are derived from the same organ, or sense, lie together in the cortex. This localization of memories has been worked out with great care and is to a considerable extent known." (Hun.) Then practically all motor and sensory phenomena can be traced from their peripheral effect to their central or cordal origin, when once we know from whence the central stimulus is received, through the afferent impulse, from where the efferent impulse emanates, and where such impulses may be arrested in their progress to and from the central clearing house. This sounds rather easy, and would be so but for the almost innumerable perceptions that crowd the cerebro-spinal system, and the diversity of avenues from periphery to centre by which communication is established and maintained.

Quoting from Herrick: "Every normal activity has what Swerington calls its reflex pattern, whose anatomical basis is a definite reflex path, but the stimulus is rarely simple and the nervous discharge is by no means limited to the part that gives the act its reflex pattern. Moreover, neither the stimulus complex, nor the character of the irradiation, will be repeated exactly in any higher animal, so that the precise nature of any response cannot in any case be infallibly predicted except under experimental conditions (and not always then)." This can be explained in part by the intimate interrelations of the various nerve tracts and central cerebral areas, as is exemplified in the instantaneous response of the other basic senses to the stimulation of one of their associates. Then we have the interrelated influences of that wonderful sympathetic nervous system with its always-to-be-reckoned-with influence on involuntary muscle fibre, with its respiratory and cardiac centres and its governing powers over the hormonic productions of the ductless glands, with their balancing influence over metabolism.

It is a self-evident conclusion that, to cov-

er this subject completely, one would have to write a book, and that such consideration as one would be able to give the subject in a local society paper, must, of necessity, be confined to only a limited consideration of some of the important points.

The localization of the motor and sensory areas of the brain, that govern the motor and sensory influences of the various parts of the body, have been worked out rather fully. When we have learned where the various areas are located and evalued the effect of inter-related anastomotic and sympathetic influences, we have gone far on the road to a knowledge of where our trouble originates and what possible methods of relief should be instituted.

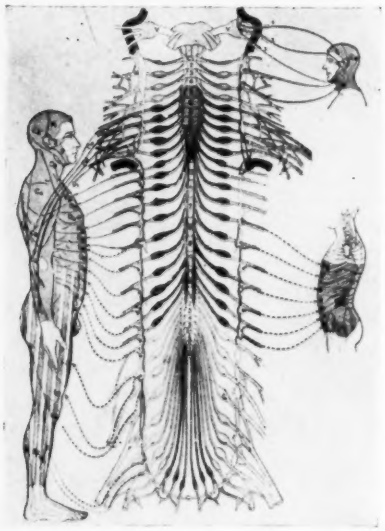

Fig. 1. (From Jeliffe and White, Diseases of the Nervous System). Anastomotic association of the cerebro-spinal nerves and the sympathetic system.

In Figure 1, we have a schematic picture of the nervous system, illustrating the anastomotic association of the cerebro-spinal nerves and the sympathetic system. No consideration of a case where organic disease of the nervous system is suspected, is complete without due cognizance of the possible role that psycopathic influence might play in a neuropathic syndrome. I like to approach a diagnostic problem of the nervous system with four elements of inquiry. Is there a disease entity? Is it central, cordal, or peripheral? What is the character? And where is it located? Then I like to add, "What and how much psychic influence enters into the symptom complex?" In the area localization of the functions of the brain, we have all the foregoing suggestions to take into consideration, plus our known and proven knowledge of the areas governing the motor and sensory phenomena.

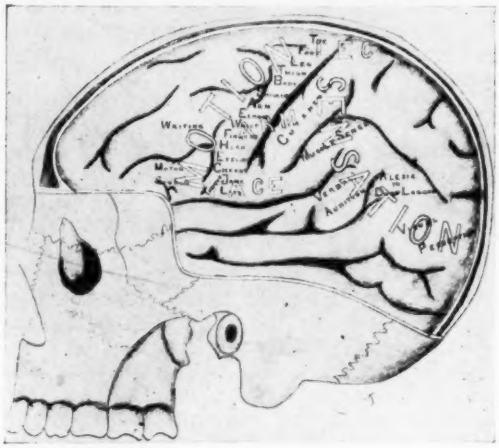

Fig. 2. (Hun's Analytical and Differential Diagnosis of Nervous Diseases). Areas governing motor and sensory influences.

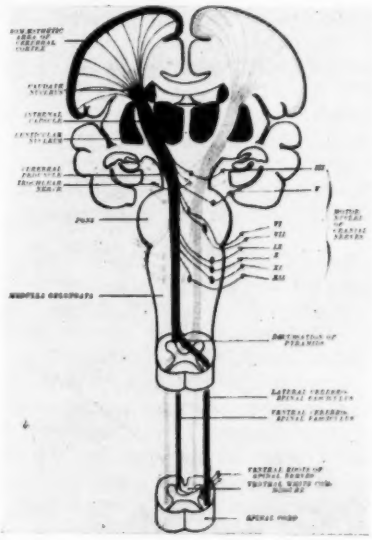

Fig. 3. (Gordon's Diseases of Nervous System). Course of fibers arising from the cortex.

Figures 2 and 3 present the known areas governing the motor and sensory influences. From these we may determine in what region of the brain sensory and motor defects originate, after we have eliminated cordal, trunk and psychic influences. For instance, in acute ascending paralysis, senile gangrene, and Raynaud's disease, we know that the dome, or interparietal region, is the part affected, if the communicating nerve fibers are uninfluenced by disease. In injuries to the head with complicated symptoms, indicating several points of initial lesion, we

naturally conclude htat we have a more or less diffuse disturbance.

I feel that no consideration of this subject should be entered into without a discussion of the intracranial nerves. We know that the branches that govern the phenomena about the head and face are given off after having passed through the cerebellopontine area and before the decussation in the medulla. Therefore, our paralyses involving areas governed by these branches are generally unilateral and on the same side as the injury to the brain, while those fibers that pass through the medulla and participate in the decussation, produce their predominating influence on the opposite side from the injury. I say predominating, for not all these fibers always participate in the decussation and there is sometimes a disconcerting mixed paralysis as a result.

A study of the base of the brain gives us some idea of the difficulties encountered in localizing disease and injury in this complicated region. Yet each area has certain cause and effect suggestions that shed sufficient light on an obscure subject to enable us to find our way in most cases. It is here in the cerebellopontine area that a mystic maze is located and frequently we are compelled to generalize our location to this area for want of specific knowldege to carry our investigations to more limited areas. A recent autopsy showed a small cyst, 3 by 2 centimeters, pressing on the basilar artery and involving the pons. This man had had head symptoms for many years. The cyst had apparently nothing to do with his death. I am presenting here three cases that will in some way illustrate the foregoing remarks.

CASE 1.

This young woman had a fall when she was sixteen years old. She took a header from an automobile. There was a basal injury to her brain. The x-ray shows no abnormality, yet here are a set of symptoms pointing to a cerebellopontine injury, with involvement of the intracranial nerves. I think we can designate this case as one of progressive bulbar paralysis (polioencephalitis inferior chronica) due to traumatism, with labio-glossopharyngeal paralysis. Analysis of the case: Cranial and spinal nerves are involved. There are practically no sensory symptoms. The condition is chronic and progressive. The paralysis involves the lips, tongue, pharynx, and the larynx. The head is bent forward. There is spastic paralysis of the muscles of the neck. There is drooling of saliva, dysarthria, dysphagia, and aphonia, fibrillating paralysis, and muscular atrophy. Thereis a progressive, mild spastic, paraplegia. Wassermann negative.

CASE 2.

This next patient, widow, aged forty-six. Her family history is obscure. Her husband is supposed to have died during an epidemic of 'flu' in 1922. She had a hard spell of sickness at this time, supposed to be 'flu.' When she was convalescent, she discovered she had marked disturbance of gait, speech, and some difficulty in using her hands. Her spinal fluid and blood are negative for all tests for syphilis. Her chlorides are diminished. Her reflexes are practically normal and there are no discoverable areas of hyperesthesia or anesthesia. Fright and emotion aggravate the symptoms. Her gait is of stereotyped character, pulling the body forward. Her eyeballs move slowly, and eyelids rarely blink. She is mentally normal but naturally depressed. The tremor of her hands is sometimes described as pillrolling. This is the characteristic festinating gait, pathognomonic of paralysis agitans, Parkinson's disease. Here we have a trauma of the cerebellopontine area, probably a sequel to an encephalitis. The fifth and seventh nerves are apparently affected, and general symptoms are characteristic of a basal, rather than peripheral, cerebral disturbance.

CASE 3.

This young woman—C. V., aged twenty-one, single,—until two and one-half years ago, about June, 1926, was apparently perfectly healthy. At this time she noticed a weakness or dragging of her left leg, with feeling of numbness in the left leg and left arm. Her right side became affected some months later. The condition has slowly progressed since its initiation. She does not have much pain in her head, and what she has is described as a dull aching, and is worse when she has a cold. Her mentsrual function is normal, of the twenty-eight, three-day type, without pain. Notwithstanding her appearance, her mentality is normal for one in her station. Her deep reflexes are normal. There is a right facial paralysis. Her eyelids move slowly. There is a flaccid paraplegia. Her spinal Wassermann is negative, cell count ten, sugar and globulin not increased, and her eye grounds are reported normal. Here we think we have an early cerebellar tumor, situated near the junction of the medulla and pons, near the midline and involving the lower part of the trunk of the facialis and the glossopharyngeus.

CASE 4.

This young woman—E. F., aged sixteen—has a fibrillating paralysis of the eyelids and tongue, and apparently paralysis of the other muscles enervated by the facialis and the glossopharyngeus. She made good progress in school until the deformity and difficulty of articulation, with some ocular disturbance, caused her to stop. Her mental state appears normal. She speaks English and Spanish. A provocative Wassermann was negative with 6, 12, and 20 drops. Eye examinations report both fundi pale and gray. Both disks are pale. Veins large but not tortuous. No apparent changes in either retina or choroid.

Diagnosis: Disturbance of nerve circulation in the facialis and glossopharyngous, near the floor of fourth ventrical. Causes considered: degeneration, pressure from small slow-growing tumor, or blood circulatory disturbance.

WANTED—We have young men and women well trained as practical laboratory technicians, graduating from our School of Public Health. Physicians, surgeons, hospitals, clinics and health departments desiring such service can secure it by writing immediately. Address Dr. L. H. South, Director, Bureau of Bacteriology, Kentucky State Board of Health, 532 West Main Street, Louisville, Kentucky.

STONE IN THE PROSTATIC URETHRA.

WILLIAM R. JAMIESON, M. D.
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(Case Report, El Paso City-County Hospital Staff Meeting Feb. 13, 1929.)

Male child, aged 6, was admitted to the urological service, City-County Hospital, Jan. 10, 1927, complaining of pain, difficulty, frequency and urgency of urination. Roentgenogram taken at this time (Fig. 1) showed

two stones located, one apparently in the bladder and the other in the prostatic urethra. Three days later the bladder was opened, but only one stone was found and removed.

Two years later, on Jan. 17, 1929, the patient re-entered the hospital on my service complaining of the same symptoms which he said had not improved since the operation aforementioned. Roentgenogram was taken (Fig. 2) and the position of the stone ascertained to be in the prostatic urethra.

On Jan. 21, 1929, under ether anesthesia, a suprapubic cystotomy was done. A finger inserted in the rectum pushed the stone out of its position in the prostatic urethra into the bladder from which it was removed. On examining the bladder neck, there was found a fibrous ring which constricted the vesical entrance and formed a pocket anteriorly. This was incised and dilated by a finger inserted in the posterior urethra.

Convalescence was interrupted by a mild pyelitis which cleared rapidly under the administration of water and hexamethylenamin.

The stone measured three-fourths of an inch in diameter, one-half inch thick and two and one-quarter inches in circumference. An interesting feature of the case is the amount of growth that took place in two years. Measuring the size of the stone in the two pictures showed an increase in diameter of approximately one-quarter inch.

GONORRHEAL PYELITIS
(With Report of a Case.)

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(Read before the El Paso County Medical Society, January 21, 1929.)

Gonorrheal pyelitis is sufficiently rare to justify the presentation of this case report. Search through such urological text books as I possess, shows that scant attention is given to the condition. In Young's Urology, page 103, Vol. I, Hill is quoted as having found fifty-four so-called cases of this infection in literature. The diagnoses were based on the following criteria:

(a)	Smear only	20
(b)	No bacteriological data available	11
(c)	Smear and "culture": no details of culture	10
(d)	Smear and culture, organism not growing on ordinary media	5
(e)	Clinical cases of gonorrhea, but cultures showed other organisms and gonococci	4
(f)	"Gonococcus present", no details of criteria	2
(g)	Smear and culture, organism conforming to all bacteriologic criteria, including fermentation test	1
(h)	Experimental human inoculation, cultures later negative.	1

According to these criteria, only six of these cases, (d) and (g) can be considered very reliable, and only one (g) absolutely proven.

While the following case does not conform strictly to the criteria mentioned in (d) and (g), yet the clinical manifestations, physical signs and the presence of large numbers of gonococci in the bladder urine are sufficient,

in my opinion, to establish a diagnosis of gonorrheal infection of the renal pelvis.

CASE REPORT

Female, 17, white, American, married, complained of: (1) pain and burning on urination; (2) urgency; (3) terminal hematuria; (4) pain and tenderness over left kidney region and along the course of the ureter.

She had been complaining for two or three weeks of frequency and discomfort over left kidney region. Two or three days before I saw her, symptoms became aggravated. Temperature 99.4. Marked tenderness on palpation over left kidney, ureter and bladder. The terminal end of the ureter, felt through the vagina, was indurated and painful. There was a mass in the left vaginal fornix that was exquisitely tender. The urine was turbid.

On cystoscopy, the bladder walls were seen to be intensely inflamed. The left ureteral orifice was found after some difficulty, but was so swollen that a catheter could not be inserted. The stream of urine from the left side was turbid, while that from the right was clear.

The patient was given intravenous injection of 20 c.c. of one-half of one per cent solution of neutral acriflavin in normal saline, at 3 p. m. Hot vaginal douches of solution of potassium permanganate, 2 gallons at a time, were given twice daily. The next morning she felt much better, temperature had dropped to normal, frequency was much diminished and kidney discomfort much improved. The ureter was still tender. Dr. George Turner reported the bladder urine positive for gonococcus in large numbers.

She was given, intravenously, 25 c.c. of the acriflavin solution. Twenty-four hours later, the frequency had disappeared, the left kidney was no longer tender on first percussion, although the ureter was still tender. At 4 o'clock the same day, a telephone message was received saying that she was suffering from burning and itching of the face and extremities. There was intense redness of these parts, the arms to the elbows and the legs to the knees. Temperature 98.66.

The following day this redness had disappeared, and was succeeded by a yellow tinge of skin which slowly disappeared. Dr. Turner reported that gonococci had disappeared from the urine.

Six days later, cystoscopy showed a normal bladder. There was no obstruction to the entrance of the catheter on the left side. The urine was clear from both sides, but was still tinged with acriflavin.

Her husband absolutely denied gonococcal infection, but in the face of an epididymitis that came on while I was treating his wife, was forced to admit the truth.

A CASE OF SYRINGOMYELIA OF THE MORVAN VARIETY

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(Read before the El Paso County Medical Society, March 25, 1929.)

CASE REPORTS

P. L. C., Mexican female, 40 years old, married, 5 feet 4 inches tall, weighing 150 pounds, without anything of interest about her past history or family history, was referred to me, after having been treated many times for many things in the past several years.

The patient says that her troubles began about eight years ago, with a growth, like a tumor, on the dorsal side of her right hand, over the fifth metacarpal. This was opened by operation and subsequently healed.

After that she began to feel some pains, rheumatic in character, in her right arm, and in the left leg. She then noticed blisters at the tips of her fingers and toes. These were painless. Later, little ulcerations occurred on these parts. Then they began to swell and infection occurred. She managed to dress with great difficulty and suffered considerable disability in her occupation of laundress. Then she noted with surprise that burns or scratches on her hand occurred without pain. The other hand and leg began to display the same symptoms. Finally, she couldn't work because her fingers began to get stiff, and retracted until they gained the actual shape and position, with a feeling of coldness in the arms and legs. At present this sensation is general to her body. She does not remember having run a temperature. She did suffer from colds rather frequently in those eight years.

At the physical examination, I found a woman not much emaciated. Her face and hair show nothing abnormal. She walks with little difficulty.

The most striking thing to be noted is the condition of the hands and feet. This suggests a progressive muscular atrophy of the Aran-Duchenne type. It starts, usually, on the right side and in the most superficial muscle of the thenar group, the short abductor pollicis. Soon this finger cannot be opposed to the other fingers to grasp an object. It is pulled back and out, due to the action of the antagonistic muscles.

Some time later, all the muscles of the thenar group disappear and this part of the hand becomes flat. These modifications make the human hand appear like the monkey's hand. In all persons affected with the amyotrophy of the Aran-Duchenne type, the movements of the hand in grasping objects are made as monkeys make them, by bending the last four fingers over the palm.

In time, the interossei muscles become atrophied too. This atrophy explains three depressions in the skin between the metacarpals, and the impairment in the function of the fingers, as these muscles direct the movement of bending the first phalanx and straightening the other two. When these muscles are atrophied, the antagonistic muscles, the extensors, pull the hand into inversion. This, with flexion of the two last phalanges and extension of the first ones over the metacarpals, makes the hand a claw. When the atrophy invades all the muscles of the hand and arm, this particular position disappears and the hand becomes bony.

The muscular atrophy is the main factor. The palsy is concomitant. The muscle is able to contract as long as it has any fibers left. First of all, the palsy is manifested by tiring very rapidly, then impairment of the movements occurs, and finally its disappearance. The tendon reflexes disappear too. The contractions due to the faradic stimulation disappear at the same rate as the muscular fiber.

The trophic troubles and the disturbances of sensation are the most characteristic symptoms. But under this type of amyotrophy nearly every case of syringomelia appears.

The skin finally shows the same trophic disorder. It appears thin and lustrous in places (glossy skin) and ulcerated; when infection occurs it is very difficult to heal. The nails and the tips of the fingers sometimes are lost by actual mutilations due to these same trophic disorders.

There is some disturbance of the sensorium also. The tactile sensation is preserved, but the thermic and pain sensations are lost. This is a thermo-analgesia. This very condition was first established by Schultze and Kahler, and called syringomyelic dissociation, because it is not found in any other nervous disease except syringomyelia, a very few cases of hematomyelia and of myelitis of the gray part of the spinal cord. However, in this case the tactile sensibility is interfered with by retard of a few seconds between the stimulation and perception.

The thermo-analgesia is very interesting in that it does not correspond to the course or distribution of the nerves, but is disseminated and disposed in zones, thus confirming its character as a medullar lesion.

The diagnosis between tabes, amyotrophic lateral sclerosis and muscular atrophy of the Aran-Duchenne type, is made by the presence of the syringomyelic dissociation. In the case of a sudden onset, it is necessary to think about an hematomyelia.

The Morvan disease, described by this same pathologist, should be differentiated from syringomyelia by the interference with tactile sensation and by the more pronounced trophic troubles until painless mutilations occur.

Zambaco claims that syringomyelia is an attenuated form of leprosy, corresponding to the type of anesthetic leprosy of Danielsen. Pitres once found the Hansen bacilli in a cutaneous nerve of a syringomyelic patient and that means that clinically the two affections are closely related. However, it is admitted that the anesthetic type of leprosy is clinically characterized by disorders of sensation along the nervous cords in the body, and pathologically by lesions of these same nerves (lepromata) which are sometimes very easy to feel under the skin of the patient.

Laboratory findings: In order to be sure about the proper diagnosis, a biopsy was done, and after careful microscopical examination for the Hansen bacilli, it was found negative, thus confirming the diagnosis of syringomyelia of the Morvan variety.

ABSCESS OF TONGUE

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(Read before the El Paso County Medical Society.)

A. M.—white, male, age 40, from Acola, Texas, admitted to Masonic Hospital, Feb. 14th, complaining of a sore and swollen tongue. I was called in consultation by Dr. E. K. Armistead.

Patient gave a history of having awakened during the night four days previously, with the left side of the tongue burning as if it had been stung by an insect. He thought possibly he had burned his tongue while smoking a pipe. The tongue continued to swell until I saw him four days later, when the entire tongue was uniformly swollen and protruding between the teeth, painful and very tender over entire dorsal surface. The floor of the mouth was swollen also, but there was little swelling of the submaxillary region. There was great difficulty in swallowing, even liquid foods, and the patient feared suffocation. The fever ranged from 99 to 101.5, with pulse and respiration only slightly elevated. The Wassermann was negative, white blood cell count 14,700 on the 15th and there were some fine granular casts in urine.

Our diagnosis was glossitis, or abscess of tongue. When the condition showed no tendency to clear up after a few days, we felt we were dealing with an abscess. However the tongue was so uniformly swollen that we had no idea where to make an incision. On the morning of the second day, the abscess ruptured through the dorsum of the left side of the tongue, and the patient made a rapid recovery.

Abscess of the tongue is not very common. Injuries by foreign bodies, such as a fish-bone, but more often from sharp edges of carious teeth, are often etiological factors. In this case we are still rather uncertain as to the cause.

Parke-Davis Scientist Retires

Following a noteworthy service of 34 years with the house of Parke, Davis & Co., Dr. E. M. Houghton retired from active duty on May 1, but will continue as a member of the company's executive staff, with the title of Consulting Director of the Research and Biological Laboratories.

Dr. Houghton came with Parke, Davis & Company on February 1, 1895, to take charge of research work in pharmacology.

In scientific circlles Dr. Houghton is widelly known as a pioneer in the filed of biological standardization, having started this work at the University of Michigan in 1894, and continuing at the Parke-Davis Biological Research Laboratories, which was the first institution of its kind in America.